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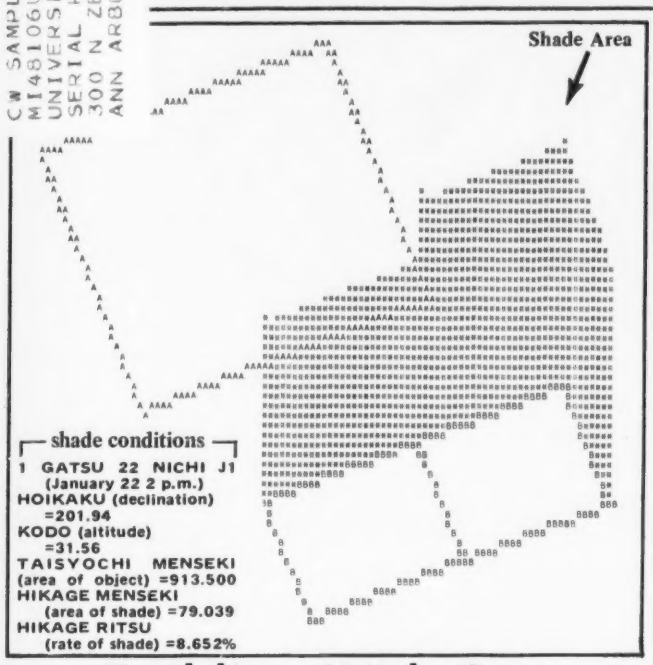

Building With Sun

Special from Shukan Computer

In the Land of the Rising Sun a "sunshine right" is a serious social issue. A software company in Japan has developed the Sunshine Check System to simulate and display the rate and area of the shade during sunshine on high-rise buildings. The shade analysis is expected to play a significant role in city planning and building and brighten the lives of sunshine seekers. The SDIL 12 program of System Dynamics Co. draws a chart of shade rate, a rough diagram of the shade and a shade diagram (above). With input on latitude and longitude of coordinates of the diagram, the program can check the sunshine at any location and at any time. Once the basic coordinates are established, the input data can be composed by three different factors – the coordinates of the building, the coordinates of the object and the optional place and time. With the input of several parameters the computer will output the information about the declination and altitude of the sun, the area of the shade and the rate of the shade in the form of a diagram and a chart. The company offers a rental system service or a calculating service to computerless users.

Two Users Diverge

DOS/VS... How Good Is It?

Weekend Work Cut by Test Site

By Don Leavitt
Of the CW Staff

LANCASTER, Pa. – Since it became a Beta test site for IBM's DOS/VS in early May, Armstrong Cork has been able to cut its DP workweek from six to five days. "We expected it to be good but, quite frankly, not as good as it is," Armstrong's manager of computer systems, Charles Letteer, said recently.

The company had a 256K 370/145, with eight 2314 disk drives, running under "real" DOS/360 for about two years prior to the VS tests. In that time, Armstrong developed what Letteer considered a good benchmark. It mimicked the normal workload and ran several hours so it was long enough to test the system without giving false results due to a single program's improvement or degradation.

Even without VS, Letteer said he was pleased with the variable partition priority feature of DOS Release 27. Operators "have a pretty good feel" for what jobs degrade others. With this new capability, they are able to balance workloads and get more

"We expected it to be good, but quite frankly, not as good as it is." – Charles Letteer.

BUT...

"The worst shock of all came when we tried to run the new system." – James S. Aagaard

throughput than with earlier DOS releases.

Concurrent with the introduction of VS at Armstrong – partly because of it – the installation changed to 3330 disks and added 128K to main memory. The systems staff has been busy enough with these multiple mod-

(Continued on Page 4)

Tests Reveal 20% Time Jump

By Don Leavitt
Of the CW Staff

EVANSTON, Ill. – "I can only conclude that the virtual storage concept as implemented by IBM has nothing to offer the small user," James S. Aagaard, head of the Information Systems Development Office at Northwestern University Library, said recently, summing up his installation's brief experience with DOS/VS.

The library has a 96K 370/135 with six double-density 2314-type disk drives from Calcomp. Aagaard noted that even before he implemented DOS/VS, he anticipated some increase in supervisor size, but only from

(Continued on Page 4)

State DPers Strike For Better Status

By Patrick Ward
Of the CW Staff

PROVIDENCE, R.I. – About 45 state government programmers and keypunch operators here took part recently in a wildcat three-day "sickout" to protest lack of advancement opportunity for programmers and to get action on a pay-step increase and other demands.

Almost all the 12 programmers and 33 keypunch operators in the Division of Methods, Central Services and Data Processing came down with the mumps and other maladies Aug. 7-9 to show their dissatisfaction. Computer operators, who had earlier received a two-step increase, kept their health.

Needs Cited

The wildcat strike was an independent action by the DP group which feels it has special needs that neither the governor nor its branch of the Rhode Island Public Employees Council has met.

"We have many grievances," said a programmer who is spokesman for the group and who preferred to remain unnamed because of the illegality of the action.

"The girls in keypunch have grievances that are peculiar only to keypunch. For example, the type of work – who is going to do which kind of work – and overtime procedures.

"In programming, we have no provision for promotion as far as higher levels of programming go, such as senior programmers, principal programmers, programmer analysts. We've got no provision for those things, so we have 12 programmers who sit here and have nothing to look forward to in the future.

"We want to see higher levels put in, we want to have openings so our DP people can be pushed up, we don't have any of those things now," the spokesman said.

A Place to Go

The department is budgeted for 16 programmers and three senior programmers, the spokesman said, but there is no provision for any principal programmer, assistant supervisor or programmer analyst jobs. The strik-

(Continued on Page 2)

Did Neglect Expose Check Fraud?

Special to Computerworld

NEW YORK – If Billy Howard Hudgins, a New York operations manager for Westinghouse Electric Corp., had not taken an early vacation this year, or if he had been a little bit more careful, a steady stream of diamond stick pins, expensive carpets and cash might still be enriching the lives of his friends, according to court papers and published newspaper reports.

And Westinghouse would be none the wiser.

Hudgins was recently charged with issuing forged checks with the help of a computer [CW, Aug. 15], but he must have known that only the dollar amounts of checks-issued were checked against checks-cashed. This was done by the computer systems in Pittsburgh, without noting the payee (the person to whom the check had actually been made out).

Hudgins went on vacation before one false check – made out to a friend of his – had come back through the bank. It was seen by a fellow employee. Normally at this point Hudgins could destroy the original checks, officials said. The other Westinghouse employee did not recall the payee as a proper Westinghouse creditor. Investigations followed, and the fraud was exposed.

Hudgins, a 46-year-old bachelor, who lives with his mother in Bethpage, Long Island, N.Y., was reportedly known as an unusually generous man, and one with exquisite and expensive tastes. But because of the $25,000/yr salary and the fact that he was a bachelor, there were apparently no suspicions about possible overspending.

Outside his department other friends may have been profiting from his acquaintance – but they apparently knew the source of the money was, in fact, Westinghouse. Their role in the fraud reportedly was to receive, endorse and cash the checks he would send them. They split the money evenly with Hudgins, officials believe.

(Continued on Page 2)

Checks Went Unchecked

The fraud that has apparently taken place at Westinghouse Electric Corp. started with an ordinary four-part form, part of which was a Westinghouse check. The sytems designer assumed that all parts of the form would be made out in duplicate. This technique was apparently not followed. Part one, the check itself, was made out to a coconspirator. Parts two, three and four, showed, however, the name of one of Westinghouse's contractors on its approved contractor table that was stored in the Pittsburgh computers.

These contractors were reported by Westinghouse in New York through its remote terminals, together with the number of the check allegedly issued to them.

Cashing the Check

The Mellon National Bank microfilmed the face of the checks being received, but recorded on tape only the check

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Program Hopes to Find Youths Likely to Use Drugs

By Toni Wiseman
Of the CW Staff

BOSTON – Can you discriminate between people who use or will use drugs and those who don't and won't?

Researchers here are using a computer to compile and analyze data which could enable them to predict which teenagers are likely to turn to drugs.

Drs. Gene M. Smith of Massachusetts General Hospital; Charles P. Fogg of Boston University; and Richard LaBrie, an independent consultant-statistician, have been running a five-year study dealing with approximately 15,000 students a year.

The students, in grades 4 through 12, provide the input data by filling out self-report questionnaires dealing with their attitudes toward cigarette smoking and drug use, their knowledge of drugs and their behaviour with respect to smoking and drug use.

This information is correlated with academic achievement and school behavior as reported by the schools attended.

Privacy Protected?

Protection of the data bank does not seem to have been an issue, and the researchers report no incidence of any one attempting to obtain information.

The study, authorized by the state Department of Public Health, required that names be used since "you can't give a kid a number and expect him to remember it for five years," Fogg said.

But all data is confidential, he added, saying, "even a parent couldn't get information on his own child."

Using data collected in 1969, the researchers predicted drug use in 1971. The analysis, they said, was 68% accurate in predicting the non-drug users who went on to marijuana alone and 77% accurate in showing which nonusers went to both marijuana and hard drugs.

The study showed that the tendency toward rebellion and cigarette smoking increased progressively from the no-drug group to the marijuana-only group and was greatest with the hard-drug users, according to the report.

Better scholastic achievement, greater obedience and negative attitudes toward smoking were highest with the nonuser group, the study revealed.

"Each of the predictors significantly discriminates between nonusers who will remain nonusers and those who will become users," the report said.

Smith emphasized that the results are only valid in terms of statistical probabilities in groups, not individuals.

"The more the individual became involved in the drug scene, the more accurate the prediction was," Fogg said, "which is logically consistent with the program itself. You wouldn't want to find that you could predict with more accuracy the kids that just messed around with it (drugs) a little bit than the kids that became involved with it very intensely."

LaBrie, who was in charge of the mechanics of the data bank, explained that protection of the information was guaranteed in several ways.

Legal Protection

First, he said, all information between researchers and subjects is confidential and protected from access by law. Thus, no one can force the researchers to reveal any data.

"We need to have names," LaBrie said," because that's the only way to follow an individual for five years, but we randomly assign each name an ID number."

The master file of names and corresponding numbers exists in a coded form in the computer. Unless a person were privy to the system, according to LaBrie, it would be virtually impossible to transform the coded names into a readable form.

As a third measure of protection, the scores of a few individuals have been deliberately changed, on a random basis.

"If someone, somehow, went through and found Robert Murphy's scores, we couldn't say whether or not they were true with 100% accuracy, because they might be among those which were changed."

Even the researchers do not know which scores have been changed, though they could probably find out, LaBrie said. "This, however," he added, "would involve a great amount of work."

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State DPers Strike for Better Status

(Continued from Page 1)

ing programmers wanted those positions created so they could fill them when they had been there a little longer, the spokesman added.

Presently, the spokesman explained, "You get an annual increment, and there are five increments that you can go to. And so once you reach the fifth increment, that's it. A programmer who has been here for five years can look forward to no further raises unless he can go to a higher level which just doesn't exist here."

The strikers were also trying to force the administration to implement a pay plan adjustment that was approved by their department chief, the director of administration and the personnel administrator, but not by the governor, the spokesman said.

The governor had said he didn't have enough money to correct all the inequities in state government and told the group, "It would be unwise to correct your particular inequity and not the rest of them," according to the spokesman.

The chief of the group's division had proposed increasing the programmers by about two grades – roughly $10,000 to $11,000 for most of them.

The increase for keypunch operators would bring their pay from $5,278 up to $6,032, the spokesman said.

The installation, which handles payroll, welfare, food stamps, registry of motor vehicles and income tax work is the state's only DP installation except for one in the Department of Employment Security.

The department has two IBM 360/30s, with disks and tape; a 360/40 with disks and tape; and a 360/20.

The group's strike did not halt its department's work. For keypunching, management "brought in Manpower girls, and took girls from different departments" who had previous keypunch experience, the spokesman said.

"They started payroll a little bit earlier in anticipation of such a thing . . . They set priorities – payroll was first and they got that out," the spokesman said. Apparently all other work was done too, except possibly payment to vendors.

But nobody filled in for the programmers, the spokesman said. "Most of our systems are up and running. Basically what we're doing is supplementing what we have or maintaining what we have."

The DP group plans to continue on its independent way. Less than 200 of the 1,000 employees in the Department of Administration belong to the union, the spokesman said.

"We have a petition with 500 signatures for a new election," he said. "Next year we hope to petition the labor board for an election . . . and get rid of this union . . . and form our own group – just to encompass data processing.

System Failed To Check Checks

(Continued from Page 1)

number and the check amount. The bank did not record the bank and account number of the creditor.

The Westinghouse Electric computers noted that the check that the New York office had reported as being issued to an approved contractor had come in with the same amount, but no check was made that the amount itself had been approved. (By keeping the amount under $1,000 and by restricting such approvals to checks allegedly made out to approved contractors, the Westinghouse controls assumed any imbalances were unimportant, and would eventually be set straight.)

It was knowledge of this phase of systems design – which is often regarded as a good, sophisticated design avoiding what appears to be unnecessary random access, and therefore having higher computer productivity – that apparently allowed the fraudulent check operation

The physical check, after being microfilmed in Pittsburgh, was returned to New York. Here it was destroyed. The check numbers were reported to have been sent to another branch. No check was made that the checks had, in effect, been sent to another branch.

Did Carelessness Expose Fraud?

(Continued from Page 1)

The weakness of the computer checking procedure was graphically illustrated as investigators tried to find out how much money was involved.

Although all the operations had been recorded on the computers, and the records were on the tape, it was decided to use manual verification methods.

As a result, when the indictments were handed down, the month-old audit had only gone back 15 months into the four-and-a-half-year fraud. At the time the total then found was about $300,000.

This was misreported as a million-dollar fraud in the national press. The figure was based on the unverified assumption that the fraud, at a level rate, would have continued through the four-and-a-half year period.

Four Checks Evaded

The checking technique of simply using the number of checks to balance the books, rather than the name on the face of the check, is commonplace in data processing.

In the case of Westinghouse Electric there were four other checkpoints which were bypassed.

- The control on the actual check numbers (the checks had been reported as sent to other branches throughout the country).
- The maintenance of a duplicate check (the check was made out in one name, and the duplicates were made out in another.
- The balancing of the creditors' accounts with legitimate credits (sources indicate the volume of Westinghouse Electric purchases was so large that imbalances were assumed to be simply a product of checks not having been issued and cashed, etc.).
- The maintenance and checking of the cashed original check (these were found and destroyed).

Is It a Computer Fraud?

What is a computer fraud?

No generally agreed upon definition yet exists. Thus there is a confusion as to whether the Westinghouse Electric case is a computer fraud.

Some people define a computer fraud as one performed as a result of the installation of a computer system. Others say a computer fraud is a fraud carried out through the use – in one way or another – of a computer.

The Westinghouse Electric case apparently happened because of a weakness in the checking systems programmed into Westinghouse Electric's computers. The actual use of the computer was small, but essential.

Moreover, it was initiated apparently because someone knew, through his knowledge of the computer system, that the weakness was there, and was able to plan accordingly.

Retired DP Executives Still at Work

By Marguerite Zientara
Of the CW Staff

NEW YORK – International Executive Service Corps (IESC) is a non-profit corporation which arranges for retired (and occasionally mid-career) executives to share their managerial know-how with enterprises in developing nations.

Carl W. Robinson of Cleveland, Ohio, retired DP manager for Bowman Products Division of Associated Spring Corp., is such an executive. Accompanied by his wife, he spent March and April in Panama City working with Francisco Wong Chang S.A. (FWC), which operates a chain of six 99 Stores in Panama City and Colon.

'Ideal Setup'

When Robinson arrived, FWC had had an IBM System/3 for a year, but was still doing inventory manually because no one knew how to use the computer. Robinson wrote a stack of memoranda for the firm telling how to transfer ordering, accounts payable, payroll and inventory control to the computer. "They had an ideal setup for it except they didn't use it," Robinson said.

While Robinson was there, he hired a DP manager with experience in programming. He and Robinson worked out a schedule which, if followed, promises a complete setup by January 1975. New programmers are working on the projects and, Robinson said, "they were going very hard on it when I left."

There is not much DP technology in Panama at the present time, according to Robinson, although it is beginning to expand. "Before I left, another company had problems with a computer and wanted somebody to come down and help them with it," Robinson said.

Robinson was very enthusiastic about the IESC program.

"After you're retired you begin to wonder what you're going to do and here you find something you're useful at yet. It made me come home feeling 10 years younger," he said.

Computer Has Big Mouth

LONDON – A computer with expressive mouths on its CRT screens may soon be available to help children lip-read. The system, developed by David Boston of the Royal National Institute for the Deaf here, can make the computer faces grin, remain indifferent, frown and mouth the "shape" of words.

Incorporating children's love to imitate, Boston envisions showing deaf children printed words while the faces on the computer screens "mouth" them, and thus they teach children to lip-read. By imitating the mouths on the computer screens, children learn to make word sounds.

By varying the shapes of the mouths on the screens, Boston can communicate all the vowels and two consonants. He plans further research to extend its range.

Boston anticipates success because computer screens, by virtue of resembling television screens, hold children's attention.

DP 'Earns' $90,000 for Dayton

DAYTON, Ohio – Want to make an easy $90,000? A new computer system is "earning" just that sum this year for the city of Dayton while revolutionizing the city's financial bookkeeping, according to Daniel A. Kleman, assistant to the city manager.

Called the Integrated Municipal Information System (IMIS), the program consolidates computer information from all city operations for quick retrieval.

Although the program still harbors some bugs, it is paying a fat dividend. In the past, Dayton kept a minimum of $4 million cash balance on hand at any given time, Kleman said, to pay any city bills that became due.

Bills Forecasted

The improved system allows city finance officials to forecast bills that will become due more accurately, thus requiring only a $3 million cushion that will drop to $2 million this year.

Kleman said in the last five months of 1972, the city earned $29,920 interest on investments of additional money freed by the computer. This year $90,000 is expected.

The $1.8 million program is funded by a Federal grant for which over 100 cities applied. Dayton was selected to experiment with public financing; Long Beach, Calif., is trying public safety data; Reading, Pa., is working on physical and economic development; and Wichita Falls, Texas, and Charlotte, N.C., are trying an overall IMIS system.

93 (29.2%) Applicants Pass Registered Programmer Exam

PARK RIDGE, Ill. – Of the 319 applicants who sat for the 1973 Registered Business Programmer (RBP) examination held April 28, a total of 93, or 29.2%, passed, according to Eric Ustad, chairman of the Certification Council of the Data Processing Management Association.

DPMA administers the examination under the Certification Council which determines policy and objectives.

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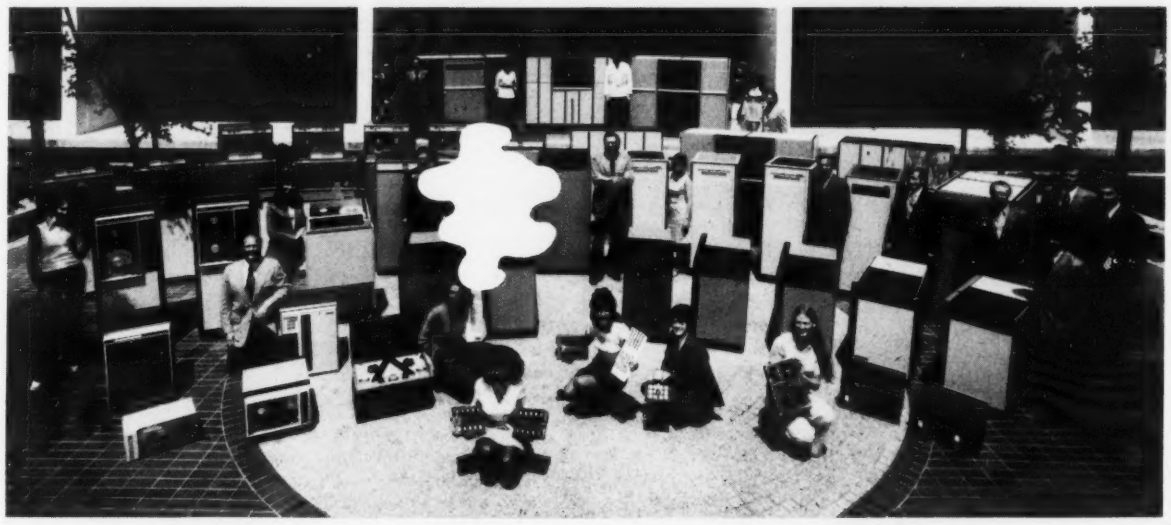

Ampex solved the tape drive puzzle by inventing single capstan drive.

Anybody out there still remember the old pinch-roller tape drive? Ten years ago it was good enough for almost everybody, even though it required a lot of alignment and was rough on tapes.

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Two Different Experiences

DOS/VS User Cuts Workweek

(Continued from Page 1)

ifications, Letteer noted, so that it hasn't had a chance to run the benchmark against each change individually, or even against the total system as it now stands.

'It Works'

But the gross improvement, the fact that the system now gets the work done without weekend efforts, is indication enough that VS "works," he said.

The VS tests have been successful, he added, because the ratio of virtual to real storage was not overextended. Armstrong started, on the 256K configuration, with a supervisor of 54K, which supported four partitions and a good deal of on-line work. The virtual partitions included one of 64K (F1) and three of 240K bytes each (F2, F3 and BG.)

Power/RJE operations used two of these partitions during prime time, and a system that polled remote plant locations, processed overnight and transmitted back in the morning, was also in use. CICS is being brought up, Letteer said, but results of its use are not yet clear enough to be significant.

Big Jobs Handled

In any case, he added, the four-partition system operated "acceptably" and he had no complaints. In addition to on-line work, it was able to handle (in prime time) jobs that had been just too big for real DOS under any circumstances.

Tests with the newly installed 384K configuration, just ended, were based on a supervisor about the same size as before and five virtual partitions: one of 114K (F1); three of 228K each (F2, F3, F4); and one of 456K for background work.

These sizes were used, he said, to make optimum use of the 3330 characteristics. A half-cylinder on the new disk system is 228K bytes, so the partition sizes tended to reduce arm movement.

Paging was not a serious problem at Armstrong because most programs actually have a working set of instructions that is smaller than the full program. But there are situations – most notably perhaps in sorting, when the SIZE parameter must be used, Letteer said.

"Turn a sort loose in a 456K partition and it will try to use all of it," he said. "Paging becomes intolerable under those circumstances." In one case, without a SIZE parameter, a sort ran an hour or an hour and a half, he recalled. With the parameter, it took five or 10 minutes.

How to Decide

To determine what size to specify, Letteer said, he used a "very gross rule of thumb. We used the size we'd used under real DOS, 62K." That particular choice meant a change in JCL but it was a minor change and the result has been sorts that run "just about as well under VS as they did under 'real' DOS."

There are about 25 analyst-programmers in the corporate data center and another four workers in Letteer's systems programming group. The applications crew works – largely in Cobol and Informatics' Mark IV systems – with all the conventional DP chores, including accounting, payroll, inventory and some operations research.

The systems group had had its role expanded considerably in the past year, Letteer said, and it is beginning to look at both hardware and software monitor systems.

"We've been running to catch up with all the changes we've put into the system, but we're just about there. So now it seems like a good time to get into performance evaluation work."

Another Sees Performance Fall

(Continued from Page 1)

16K to "less than 32K."

He said, in view of his expectations, it was "somewhat of a shock" to read a report of IBM's comments about VS at a recent Guide meeting [CW, July 4]. "It was more of a shock to assemble a supervisor with a size of 42K. However, the worst shock of all came when we attempted to run the new system!"

Aagaard set up a series of test cases to be sure of what effect DOS/VS would have on his operation. Tests under Release 27.1 of "real" DOS were in a 32K background partition, with a lightly used foreground partition polling a few remote terminals.

Tests under DOS/VS were run in a dedicated environment, with a total of 54K bytes of real memory available for application programming after the 42K supervisor was loaded into the 96K storage.

For the first test, Aagaard selected a program that searched a file of about 130,000 records and selected those which met certain criteria, writing the selected records to another disk. The criteria used for the test caused about 40,000 records to be selected, and required 10:04 (min:sec) under DOS.

Using the same criteria, the program required 12:03 under DOS/VS, an increase of about 20%, Aagaard noted. Since the program was small enough to fit into a 32K partition under "real" DOS, he said it was small enough that no paging was needed for its use in the VS environment and the increased run time "can be attributed only to the necessary address translation operations."

An attempt to sort the file of selected records produced "even more disastrous results," Aagaard reported. The file was sequentially organized and used an index of Northwestern's own design. The sort required 8:58 under the old, 32K DOS partition system.

For its first VS sorting, the library tried a 160K virtual partition. As Aagaard had expected, the paging activity was substantial, but when the internal sort phase had not been completed at the end of 45 minutes, the job was cancelled.

A reduction of the virtual partition to 64K, which generated – in Aagaard's view – only a small amount of paging, enabled the sort to complete in 18:53, more than double the time of the "real" DOS sort.

Aagaard noted that 64K is the smallest virtual partition that can be provided unless the JCL for each job is modified.

In any case, Aagaard ran still another test. A simple list of the disk file required essentially the same time under both systems.

Obviously, Aagaard shrugged, the time was determined by the printer speed in this operation and not by anything peculiar to either DOS or DOS/VS.

In a further attempt to isolate the cause of the performance degradation, even with no paging activity, a program was written to just loop through 28K of storage without doing any input or output. Aagaard clocked this program as taking "about 3% longer under DOS/VS," indicating to him that the main problem is with I/O operations.

By this time, he was getting philosophical, and wondered what factors might possibly offset the seriously impaired performance. If the added flexibility in the use of memory made possible the simultaneous operation of two batch partitions, he admitted, it might still be possible to accomplish more work in the same time.

But in a configuration such as his, that is impossible. Another batch partition would require either additional "unit-record" I/O gear or a spooling system such as Power. The spooler would, as far as Aagaard could see, "sop up all the rest of our real storage and require some more disk storage to boot, not only for the spooling files but to provide work areas for the programs.

Aagaard's installation hasn't ruled out DOS/VS altogether on the basis of two or three weeks of experience with the new system. He said the library has to consider it "mainly because it appears to be the only way to get programming support for new I/O hardware," as well as "a badly needed replacement for Isam."

There is nothing inherent in these improvements that requires a virtual storage system, Aagaard felt, "but IBM in its infinite wisdom has decreed that this is the way we must go."

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From Bozeman to Bianze

Here's Some Data on the Hoof!

BOZEMAN, Mont. – Rodeo fans here no longer have to wait for indefinite periods to find out the final results of the Montana State University competition.

A computer is now in charge of keeping track of what is happening competition-wise and of handling the computations which determine the winner.

The program, written by Nick Shauger, MSU Electronics Research Laboratory, does more than speed up the availability of the MSU results. It also keeps track of the national standings of the competitors on a year-round basis for all rodeos. Standings are continually updated, so that exact team and individual standards are available at the beginning of each show.

For the MSU rodeo, the computer even matches the students and the stock for the competitions. "We take the animals and the order that the contractor wants them to be used and rested, and put the data into the machine," Shauger said. "Then we feed in the names of the competitors and the computer uses a random numbers scheme to do the matching."

There's No Getting Away From the Bobbies Now

LONDON – Stolen cars will need to make faster getaways now that the West London police have computerized identification of lost and stolen cars.

In addition to helping the cop on the beat, the computer experiment is identifying the ways in which patrolmen use the system. To this end, the men were given only minimal computer training.

"At the moment we are letting the men use the terminal their own way," said a police spokesman, "and we'll be studying a weekly printout from the computer to determine the pattern of use."

The information on the stolen cars, and on the patrolmen's reaction and applications to computer techniques, will form a basis for the new police national computer slated for start-up next year.

Mini Boosts TV Station's Election Coverage Ratings

SAN FRANCISCO – Just as political candidates compete for votes during election campaigns, so do the TV stations compete for election coverage viewers. One station here used a computer to help boost its ratings.

Station KRON-TV used a minicomputer to receive, tabulate, store and display voting information, giving viewers the latest tallies and percentages on their TV screens.

The California primaries had an unusually large line-up of names and issues. Election information was prepared in advance in "pages" listing district, contest, candidates and party affiliation, in approximately one-tenth the time it takes to do the job manually.

Updating took only three minutes on the Data General Nova 1200, with reporters calling in vote totals and six teletypewriter operators inputting data to the computer.

"The viewer ratings justified the expense of the system," said election producer Clark Briggs.

Shortage of Housing? Not for Santa Clara Cons

SAN JOSE, Calif. – There will be no shortage of available accommodations in Santa Clara, at least for criminals.

The Santa Clara County Board of Supervisors is asking the Law Enforcement Assistance Administration for a $37,293 grant to help it predict jail populations.

The grant will be used to set up a computer-based data system to analyze and predict jail population fluctuations and identify alternatives in the criminal-justice system.

The project is a move to ease the chronic over-crowding problem at the Santa Clara County Jail.

'Lifetime' of Research Squeezed Into 15 Minutes

DAYTON, Ohio – A computer is helping Dr. Anthony Vagnucci squeeze a lifetime into 15 minutes.

A "lifetime" is what Vagnucci, chief of the adrenal unit at Montefiore Hospital, Pittsburgh, Pa., estimates it would take him to do radioimmunoassay calculations and quality controls with electronic and mechanical calculators.

Radioimmunoassays are a new technique which allows measurement of small amounts of hormones in the blood or other small units in picograms. "No one could do this sort of research today without a computer," Vagnucci said.

Tests are conducted in the hospital laboratory. The calculations are entered into the keyboard of an NCR 260 terminal located in the hospital's medical library, which is connected by telephone to a computer at the University of Pittsburgh, where the research results and programs are stored.

Italians Can Count Chickens Before They Hatch

BIANZE, Italy – The Genetic Research Division of Avicola Agli-etto has reported that the first all-Italian poultry strains, Eureka (egg-layers) and Big White (broilers), developed with the aid of a computer, have fully come up to expectations after one year of trial by Italian poultry breeders.

The strains were developed by the division with the aid of a Honeywell Model 58 computer system, on which 4.5 million items of information concerning 150,000 parent birds are stored each year.

The company uses the computer to keep track of data on such characteristics as vitality, development and production in order to determine ratings on production and growth of the birds.

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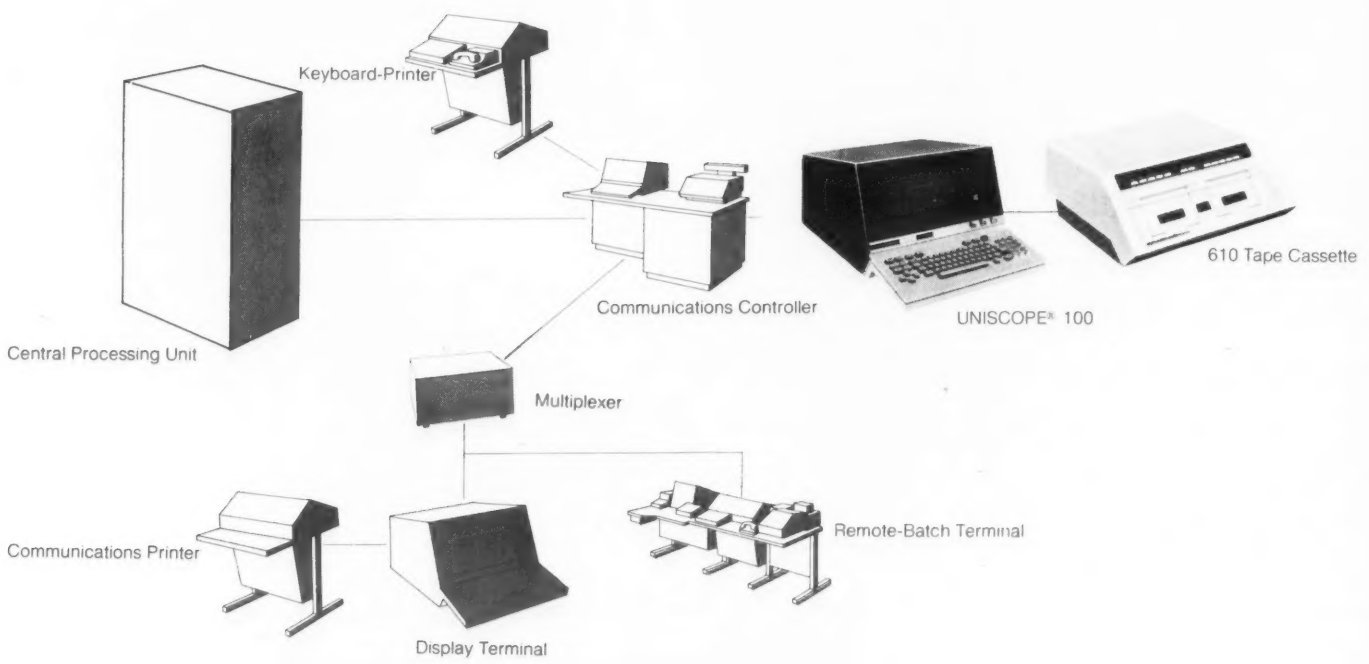

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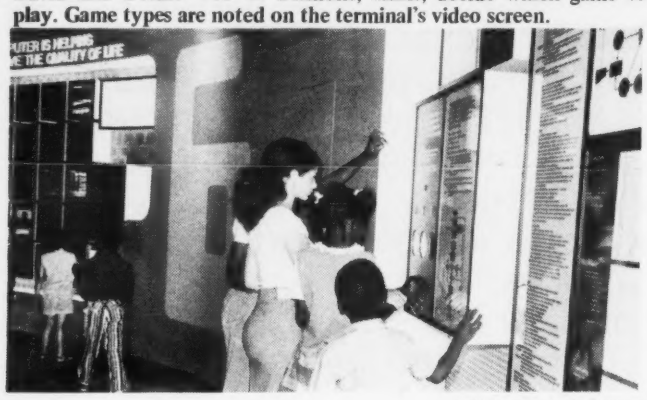
What Works Hard...

David and Deidre Veo of Belmont, Mass., decide which game to play. Game types are noted on the terminal's video screen.



CW Photos by Leslie Flanagan

Part of the 2,000-sq-ft exhibit includes a history of the computer as well as its functioning and uses.

A bit of Cubism perhaps?

...And Still Looks Good?

"Calculations, museum information and games." These are the programs confronting visitors to the Boston Science Museum as part of its Honeywell computer exhibit. Visitors can communicate with a Honeywell Model 316 mini via seven CRT terminals and calculate math problems with up to 25-decimal place accuracy. The museum information program illustrates the information retrieval capabilities of the computer. And the game programs include both simple and complex exercises including Simple Simon and Tic-Tac-Toe.

The mini has 16K words of main memory and an additional 7.5M words stored on magnetic disks. The 316 can access from main memory in 1.6 μsec and from the disk unit in 55 μsec. Transfer rate is 78 kword/sec.

Hey, I'll Book Ya a Ride!

TURKU, Finland – If you've ever arrived at the airport for a flight only to find that the computer assigned 350 passengers to a 280 seat plane, you understand the problems of booking travel reservations.

The same problems exist whether you travel by land, air or sea, only by sea the problem factors are somewhat multiplied. Theoretically, there are more than 20,000 alternative possibilities in booking a sea passage. Bookia has been designed to juggle these factors and come up with rapid, accurate bookings.

Situated at the Silja Line headquarters here, the Bookia computer center serves as a central booking base for offices in Helsinki and Stockholm as well. When booking centers are closed, a batch system takes over.

Bookia operates as a real-time system, with 40 Uniscope 100 terminals, two Univac 9400 CPUs with 131K memory, and six 8414 disk units with a storage capacity of 29M characters each, as well as two card readers and line printers.

The system is based on three main files: an availability file containing a description of each berth on all Silja Line sailings up to one year in advance; a booking file containing information on all passengers who have been booked up to and including the previous day, for future sailings; and a log file containing all booking operations entered during a day and which will change the contents of the booking file during the nightly update.

Before You Bid, Check the Computer

SYDNEY, Australia – A minicomputer is helping an Australian air conditioning engineering company make faster and more accurate cost estimates when bidding for contracts.

The company, Thomas Clark and Son Pty. Ltd., credits the computer with helping obtain several million dollars worth of contracts recently.

"The computer has more than paid for itself since we installed it in February," said Warwick O'Brien, the company's chief engineer. "The computer pointed up those areas where we had overestimated the cost of duct work because of lack of knowledge," he said.

O'Brien noted that the company decided to computerize duct estimating because manual estimates took too long and were not accurate enough, and because there was not enough feedback of statistics on the work involved in fulfilling a contract.

The system's role will be expanded to include other engineering calculations such as heat loads and water and air balances, which require large volumes of tedious calculations.

The system is made up of a Data General Corp. Nova 1220, 16K words of memory, a 1.25M-word moving-head disk for mass data storage, a line printer and a teletypewriter.

Here's what you always wanted to know about your IBM 370.

Never before has so much confidential information been available to the computer user.

Thanks to actions in Federal Court, IBM's internal papers on its IBM 370 have been brought to light. These "Greybooks" contain a wealth of previously unavailable information on the various models of the 370 — including detailed plans for last year, next year, and every year through 1980. Even IBM salesmen haven't seen most of it. And it can be an invaluable planning tool for any computer installation.

Now these Greybook reports are available to you — in clear, easy-to-read book format — with a page-by-page commentary by the well-known, user-oriented columnist, Alan Taylor.

Almost every page has some information that will help your installation. Alan Taylor's commentary, spotlighted by a specially designed format, provides additional relevent information, and helps make each volume into a practical, useful tool for everyone concerned with the 370. As user, manager, controller, programmer, planner or salesman, there is something here for you. You need a copy of one or more of these books for your professional purposes — and you will want your colleagues to have their own copies so that you can work together.

The facts in these books are fascinating. Among other things they contain are:

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SCIENTIFIC AMERICAN is one of the most prestigious and successful of U.S. publications. With a fully paid circulation of 500,000, it reaches an elite strata of scientific and humanistic readership throughout the world. In common with other large circulation magazines, a major administrative function within SCIENTIFIC AMERICAN concerns subscription fulfillment and specifically the order entry "cage" in which subscription renewals (and accompanying payments), gifts, new and agent orders, address changes, deletions and other alterations are accounted for and prepared for entry into the master circulation list.

After years of processing transactions manually—that is, all functions from the opening of the daily mail to the entry of its data into the central computer—SCIENTIFIC AMERICAN now utilizes Datapoint 2200 Business Computer Systems for these activities. The results?—"A real breakthrough," says Felix Kalin, data systems manager for the publication. "With the 2200's we can give same-day service to virtually all incoming mail, even in peak seasons, with substantial improvement in employee productivity and a lower direct cost to the magazine."

The Datapoint 2200, which combines a fully programmable computer with a video display, keyboard and internal tape cassettes, integrates into one handling function tasks that formerly required as many as four different work stations. "The 2200 automated cage gives the operator total control over the accurate disposition of mail and the data it contains from start to finish, instead of just unchecked 'pieces' of the job. The result has been a more productive employee, and a happier, more responsible one," notes Kalin.

All incoming mail to SCIENTIFIC AMERICAN is routed through the subscription fulfillment "cage," where the Datapoints are programmed to provide "guided entry" and immediate validation for each data element. The cursor oriented video display as coordinated with an audible click or beep gives a teaching machine response to each keystroke, guiding options, exceptions and corrections. Dynamic relabeling of ten function keys prompts one-stroke, precise capture of most fields. "Each guided entry program is optimized to support the specifics of the clerical job design—not the other way around," said Kalin. This approach is applicable to many other magazines. And in fact, we are making the program available to other publications in cooperation with the Datapoint Corporation."

The Datapoint 2200 delivers at SCIENTIFIC AMERICAN and at many other organizations around the world for a variety of data entry, data communications and data processing applications. Prices on this unique system begin at $6040. For further information contact the Datapoint sales office nearest you or write or call Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas 78284, (512) 696-4520.

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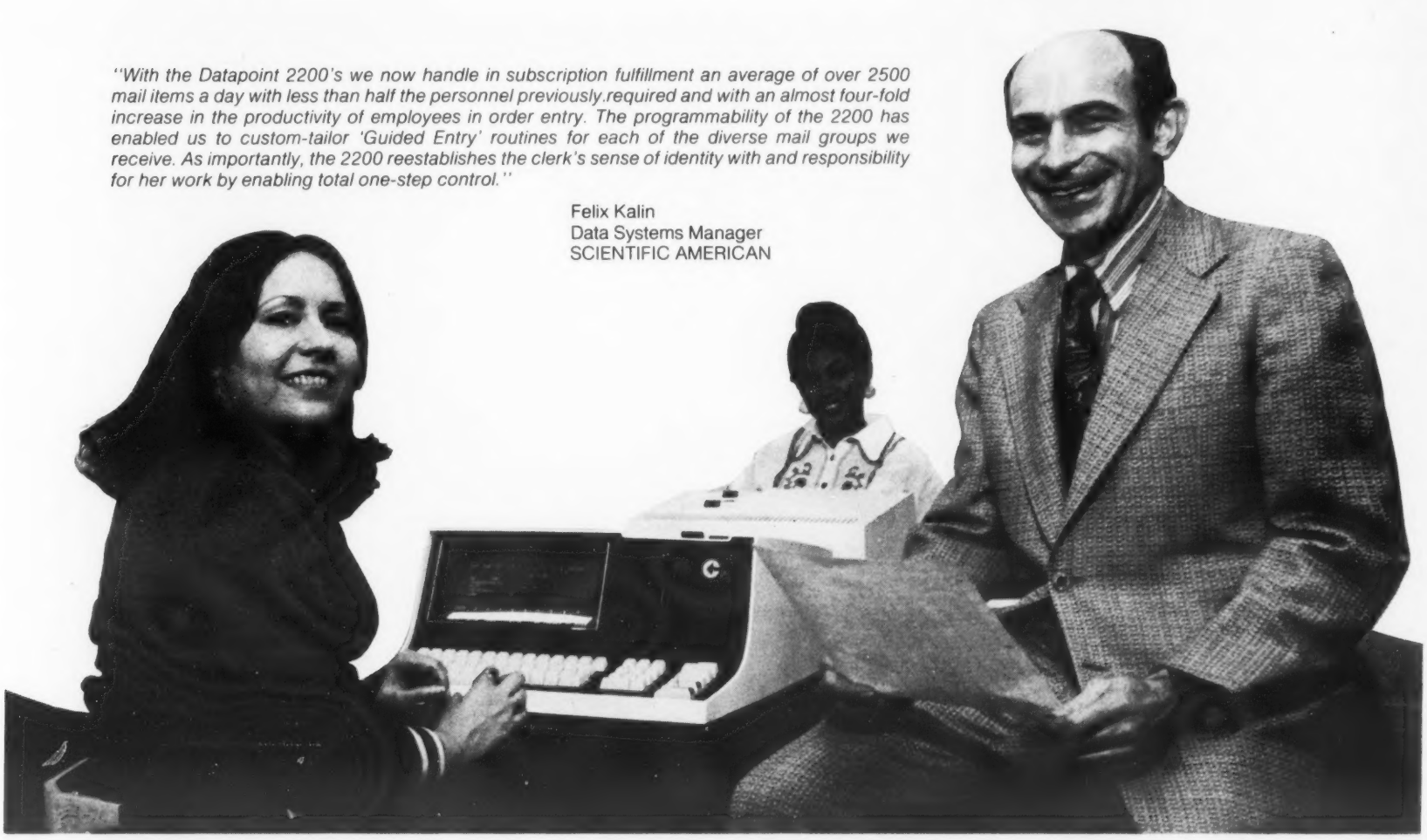

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Where Were Higher Ups When They Were Needed?

Million Dollar Effort... And 3 Idle Computers

Lack of Support May Have Scuttled City's DP Project

By Marvin Smalheiser
CW West Coast Bureau

SAN DIEGO – Three computers sitting against a wall in this city's computer center are all that remains of a million dollar effort to set up a computerized citywide command and control project.

The machines, plus some peripherals and software, are valued at $307,000 and have been idle since March 1972.

Efforts to sell them have produced only token bids, such as one of $46,750.

The command and control project produced blushes on all sides and cost the city's data processing chief his job before the city halted the effort.

City officials decided they had bitten off too much when they learned it would take $4.5 million to complete the job.

Now city officials say that all was not lost since the city did set up a modern microwave communications system for city vehicles from a $695,000 command and control grant.

D.R. Pardee, data processing director, said plans are still being made for a command and control system but it will grow in segments rather than emerge all at once.

Best Laid Plans

The concept that captured the imagination of the city in the late 1960s called for a massive computer system which would do a multitude of things instantly.

It would direct firefighters to fires, the public utilities department to unpaid bills and the police to emergencies.

The command and control system would provide all the city departments with instant information so they could act effectively on a moment's notice.

To create the system, the city sought specifications from 20 computer firms. It asked them, in effect, to trade-off a loss to build the system for San Diego against the expectation of contracts from other cities in the future.

But 16 companies said no and IBM proposed a "pay-as-you-go" basis, declining to commit itself to a contract that could have produced tremendous losses.

NCR, which had just opened a plant nearby, offered in 1970 to set up a program for $361,720 and a contract was later signed for the design, programming and implementation of the system.

The city also agreed later that year to buy an NCR Century 200 for $354,834.

Other contracts for lesser amounts followed.

And so did a change in city government and a review of the project's progress.

The review disclosed delays and slippages in schedules and doubts that the system would ever work.

In March 1972, it was determined that another $4.5 million would be needed to meet the program goals and the city decided to back off, feeling it was in over its head.

Summer Settlement

That summer a settlement was worked out in which NCR agreed to take back most of its equipment and refund the city $459,789 for money paid for incompleted work.

Various reasons were cited for the change in plans – the system was too big to undertake at one time, the main computer was too small for the job, the city was constantly changing its requirements, the city failed to hold NCR to the contract all along the way.

Changing Changes

An NCR spokesman described the project's failure as "an example of what can happen when system requirements and schedules are subjected to major and continuing changes.

"It reinforces the truism that the installation of a complex EDP system must have the active support and participation of top management," he said.

That support did not continue, he said, after a new mayor and city manager with different priorities took over.

NCR maintained, however, that the basic concept was viable.

Pardee, who joined the city in October 1972 from General Dynamics after his predecessor lost his job because of the project, said:

"We take the viewpoint that we were pressing the state of the art. Much of the hardware components, like vehicle locators, and a major share of the software were nonexistent.

"It was just too ambitious a program.

"We are reevaluating it and we want to eat the elephant a bit at a time instead of taking it in a whole enchilada."

Pardee is still trying to unload the three computers.

Two are Varian 520i machines with teletypewriters for I/O. The other is a Xerox Sigma 3 with card reader and punch and a 300 line/min printer.

The Varian minicomputers cost $58,000 each with a special interface valued at $20,000.

The Sigma configuration is estimated at $134,000.

Pardee said the hardware is worth about half its initial cost and he is still trying to recapture 30% to 40% of the cost.

But there have been few bidders and the $46,750 bid for all the equipment was deemed not worthy.

Pardee is still meeting with the U.S. Law Enforcement Assistance Administration (LEAA) and the California Council on Criminal Justice, which administered the grant, to work out a settlement.

And what advice does Pardee have for other cities?

Other cities should proceed in "modest, well-planned increments with regular checkpoints for progress status," he cautioned.

He also favors off-the-shelf hardware and software.

Yes, All the Players!

BOSTON – A computer here is such a baseball buff that it can print out Sandy Alomar's batting average, or for that matter the statistics of any player in the American League.

An NCR 100 at the Sports Information Center produces a daily statistical update of hitting, fielding and pitching averages for each team, gathered from simple report forms on the previous day's games.

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The Master Builder Gets an Apprentice

CAMBRIDGE, Mass. – A person may someday be able to design his own house by consulting with a do-it-yourself architecture computer being developed at MIT.

One part of the architecture computer – a program for recognizing hand drawn sketches – is already under way. Called Hunch, the program allows the computer to recognize and interpret house plans or other drawings executed by hand on its computer-sensitive pen and paper system.

The MIT architects are now working on ways for the computer to make sophisticated inferences from the sketches, and to allow the user and machine to "converse" about the sketches. With the computer as consultant, a person could decide on placement of rooms, doors and other features.

To make this interaction possible the computer has to make overall sense out of a person's drawing, so the architects programmed it to "watch" as the user drew and to interrupt, and ask questions when necessary. The computer's pen can even sense how much pressure is applied to the pen and tell how deliberate a certain line is.

"Hunch is not looking at the sketch as much as it is looking at you sketching," Professor Nicholas Negroponte said. "It behaves like a person watching you sketch – seeing lines grow, and saying nothing until asked or triggered by a conflict. Our goal is to let you be as graphically freewheeling and inaccurate as you would be with a human partner – to make it as easy as sketching on the back of an envelope."

When the drawing is completed, the computer analyzes it by searching for straight lines, intersections and curves. The scientists are currently giving the computer more sophistication in recognizing the higher meaning of drawings, in sensing three-dimensionality and in recognizing such features as doors and windows.

DP Still Lags After Army File Fire

By Patrick Ward
Of the CW Staff

OVERLAND, Mo. – The fire at the U.S. Military Personnel Records Center here did not directly damage the building's computer center, but DP operations are still "not anywhere near a full schedule" five weeks later.

The fire knocked out the computer system's air conditioning system, and this more than any damage has prevented the return to a full work schedule, explained Quenten Looney, director of systems at the U.S. Army Reserve Component Personnel and Administration Center.

"What the fire did was not damage the equipment so much, but the ability to control the environment," Looney explained.

"They put in a special air conditioning system to bring down humidity, but it's not sufficient" to allow running the computers, he added.

The Army Reserve computer installation, with two RCA 3301 computers and a CDC 915, was two floors below the center of the fire on the sixth floor.

Water damage was the biggest threat, but the fact that the computers were on a raised floor helped protect them, Looney remarked.

There was no sprinkler system in the computer center.

One Little Crime Leads to Another

WASHINGTON, D.C. – The FBI's National Crime Information Center (NCIC) recently scored two "hits" against crime.

A Missouri sheriff received a call from a local motel that a man had used a forged $50 Traveler's check for room payment.

Armed with a description of the suspect and his vehicle, a deputy sheriff stopped the car and contacted NCIC through the Missouri Uniform Law Enforcement System (Mules).

The NCIC report showed that the vehicle license had been stolen in Indiana. Score one for NCIC.

Under interrogation at the county jail, the man revealed his correct name. Another Mules/NCIC check showed the man was wanted by postal authorities in St. Louis for a postal violation. Score two.

The sheriff's office then sent a message to all states to determine whether the man was wanted in other states on similar charges. Three positive replies came back – two for forgery and one for theft.

ON-LINE TERMINAL OFF-LINE TERMINAL AND INTELLIGENT "3270."

INTRODUCING THE SYCOR 250. It's our new intelligent on-line terminal that's lower priced than IBM's 3270* and compatible in both hardware and software.

In fact, you can just plug it into any IBM network and let it go to work.

But, unlike the 3270, our Sycor® 250 has many of the intelligent features that have made our Model 340 remote batch terminal so popular.

Features that let the 250 check branch office key entry field-by-field instantly, providing clean data to the computer and significantly improving operator efficiency. What goes into the computer goes in clean (at up to 4800 baud)

*A trademark of IBM

—and you spend less time on the line. So, you can install more terminals per line, and probably end up needing fewer lines and ports.

NEW DUAL TRACTOR PRINTER The 250 has some pretty impressive optional equipment, too. It's available with a badge reader, a light pen and a family of versatile printers.

The printers are our new 2580 series, with 40, 80 or 165 cps speeds. They feature dual tractors that handle two independent continuous forms simultaneously. So now you can combine your forms printing and administrative message traffic on one printer.

HOOK A SYCOR 250 INTO YOUR 3270 NETWORK See what our 250's intelligence can do for you. We think it's the best in the industry.

And we're the people who invented intelligent terminals in the first place.

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Sycor has opportunities for experienced data processing equipment salesmen and systems engineers in major cities.

DP Used to Review Death Penalty Cases

ATLANTA – Criminals in this state who receive the dealth penalty will soon get some assistance in reviewing their cases.

A new law requires that the Georgia Supreme Court review every death penalty case to insure that justice is being administered evenly across the state, by comparing previous decisions made in similar cases.

Case Data Bank

To speed this process, the state is building a data bank summarizing some 500 capital cases tried in Georgia courts since Jan. 1, 1970.

The system is still in the tentative stages, according to Robert Crow, head of DP for the court. He estimated it will take some 200 bytes of memory to record each case when the information is fed into the state's 360/65.

The Georgia statute restricts the death penalty to seven offenses, and with the exception of treason and skyjacking, the death penalty cannot be imposed unless one or more of 10 aggravating factors, such as killing a policeman, are also present.

...Where the Deer Are

NEW BRUNSWICK, N.J. – Here's a new dimension to deer hunting.

After the deer seasons of last fall, Robert Lund, project leader of the deer management unit, Bureau of Wildlife Management, contacted a statistician at Rutgers University to prepare a computer program of the pertinent information gathered by biologists at the mandatory deer check stations last year.

Data such as age, antler measurement, sex, weight and location of kill was input on each of the 11,021 whitetailed deer taken last year. "Within a few months we had compiled data as the breakdown of the annual deer harvest not only by region and county but by townships as well. We've also obtained data on the overall development of the deer herd state-wide as well as the relative abundance of whitetails by area," said Lund.

Editorials

'Poor' IBM

Without in any way discussing the justice, or the legal issues, of Judge David Edelstein's contempt citation, we remind our readers of the defendant's financial status. If the $150,000 a day fine is deductible as a business expense, as were the General Electric antitrust penalties 10 years ago, it represents 2% of IBM profits. If not an allowable tax deduction, it would be 4%.

If an action is to have effect, if it is to punish or coerce, certainly it must be substantial relative to the resources of the person or organization involved. We believe the rate chosen by the court is too low.

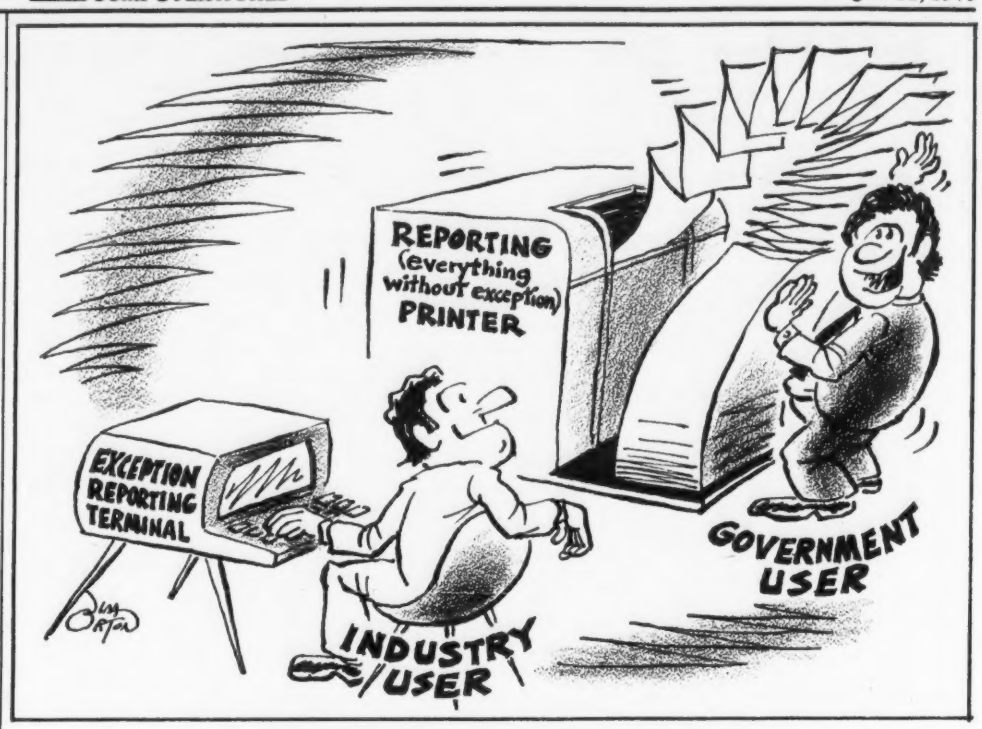
. . . IBM has suggested $100 a day would have been proper.

The Horrors of Emulation

The Burroughs Corp. has announced its intention to provide IBM 1401 emulation software for the new 1700 series. Such emulators date back more than nine years, and the undoubted fact that thousands of installations continue to operate in the mode – enough, in fact, that Burroughs feels it can afford to write, check out, install and maintain a special software package for the market – is a challenge to the profession as well as a scandal.

Even worse, however, is the prostitution of a beautiful new machine. "Buy our equipment," says the salesman, "and we will help you continue your present ugly and wasteful practices for another 10 years."

It's a perfect example of how to misuse the power of our hardware and our people.



'But What Do You Do for Hard Copy'?

Letters to the Editor

IBM Is Precedent For Nixon Refusal

It is clear that the President of the United States has a precedent in not turning over documents to any committee of justice or government. President Nixon believes the executive privilege is sufficient to not turn over documents. IBM believes that a world-wide monopoly has the same precedent. Both groups are outside the law of the U.S.

IBM has been negligent in giving to the court 1,200 pieces of information that had been requested of them. It is not known how many documents or recordings that the President would present to the Congress by way of the judiciary.

Why should the President be forced to give documents to anyone under law when IBM is not required to do the same?

Thomas E. Doyle
GSM
Summit, N.J.

What Standards?

I assume Neil Jackson is referring to a need for operating or control standards not audit standards ["Bank Auditors Do It Themselves – Form DP Group," CW, Aug. 8].

Bank EDP audit standards, which have been in existence for some time, will be discussed by a speaker at the Eastern States' Association of Bank Data Processing Auditors, which will be held Sept. 17-19 in Philadelphia.

John F. Elsbree
Vice-president, General Auditor
State Street Bank and Trust Co.
Boston, Mass.

Ethics Course Exists

The July 18 issue of *Computerworld* contains an interesting article by Mike Merritt entitled "Don't Overdo DP Security." In the article Donn B. Parker is quoted as having no knowledge of a university which includes instruction in professional ethics.

In fact, the University of North Carolina offers just such a course as Parker proposes and has for several years.

E.M. Danziger
Director Administrative DP
University of North Carolina
Chapel Hill, N.C.

IBM's Potential Payout

Re "What is IBM Going to Do With Its Trapped Riches"? [CW, Aug. 8]:

As for IBM's dividend policy as an alternative use of funds, under current government regulations corporations can pay dividends at a rate equal to their five-year average payout ratio or at a rate 4% greater than that paid the previous year.

Based on its average payout ratio of 47.7% and earnings per share of $8.82 in 1972, IBM could pay a cash dividend of $4.21 in 1973. The current indicated dividend is $4.48, up 4% from the $4.32 paid in 1972.

IBM cannot benefit from the dividend payout rule as many companies have. Therefore, IBM cannot pay extra dividends from its $3 billion portfolio of short-term investments. If dividend guidelines are relaxed, IBM will probably make a substantial increase in its dividend payments.

Michael J. Nalevanko
Securities Analyst
Pershing & Co., Inc.
New York, N.Y.

No one in the financial community expects the current limitation on dividend payout to continue very long. On the other hand, IBM's three billion lovely dollars will be around indefinitely – and proliferating hugely. Ed.

Protect Privacy First

The implication left by Bride, Taylor and Grosch [CW, Aug. 8] is that the HEW committee came out against a standard universal identifier (SUI, or "UID") in principle and absolutely.

In fact, a reading of page 112 shows that its conclusion was that privacy safeguards must be established first, then "the question can surely be reexamined." It was the deliberate policy of the committee *not* to state 'safeguards first, then a SUI,' for fear that overzealous officials might reverse the sequence. Likewise, the roadblocks to greater SSN use are stated to be "until safeguards . . . have become established" (page xxxiii). "After that, the question . . . might properly be reopened."

Even if we agree with the entire HEW report, the way is still left open to plan for an SUI or UID, based on the Social Security Number or not, so long as the public is protected first and always.

T.D.C. Kuch
Bethesda, Md.

As California Goes...

I'm happy to be a sort of mascot for NASIS (National Association of State Information Systems), which met Aug. 6-8 at the Pump Room. I was the Phantom Speaker for the ladies, several of whom would undoubtedly have preferred "The Devil in Miss Jones," even for breakfast!

The senior state ADP people who make this group so important were hemmed in by a phalanx of suppliers. Us mascots (Grace Hopper was there too) noted their number with some concern. IBM in particular, sensitive to its relatively minor federal position, is determined to dominate the state and local government business (in other countries too, but that's another story.)

Conspicuously, and I would guess happily, surrounded were Lee Smith and the Californios, determined to procure new equipment for consolidated data centers at least equal in bulk and weight – and inefficiency – to the 11,000-page procurement spec which was trucked to Big Bidders last year. Corruptible and incorruptible officials alike were at the center of the maelstrom.

Microvendors like Memorex couldn't afford to *house* the document; minivendors like DEC couldn't afford to read it; regulars like NCR couldn't afford to bid it; major vendors UNIVAC, CDC and Honeywell couldn't stay in the race: Supervendor wins again!

Or does it? In something between blissful ignorance and backcountry shrewdness, the California legislature recently required two bids or more on major ADP procurements. Great strategy: step one, all IBM competitors agree not to bid; step two, IBM sues *them* for illegal actions under antitrust!

Anyhow, it would be only fair to say the bureaucrats are confused, IBM is determined, Univac is angry and NASIS is alert.

There is good coverage in the national trade press, CW and *Datamation* and *Electronic News*. Vendors, victims and professionals should follow the stories closely; as the Original Operating Manual puts it," . . . so shall ye be also"!

One improvement I'd advocate is to prohibit bale-sized bid invites; 200 pages should be plenty. Another would be to call on the appropriate organizations (NASIS, and to a lesser extent, DPMA and ACM) for guidance: a standard procurement procedure, the size restriction I mentioned and so on.

A third would be to use a select committee of legislators and computer professionals (California is oversupplied with both, along with smog and swamis.) This gets around the feeling that CA is too big to get help from other states (false), or too unimaginative (probably false) or too proud (alas!).

Meanwhile, on another battlefield, everybody's two least favorite turnkey outfits, Computer Sciences and Ross Perot, are battling over the soon-to-be-prostrate form of Orange County. Or perhaps, like sex in mountain country, OC is going to get stood instead of laid!

Anyhow, the same scurry of salesmen and whiff of corruption abounds, and the same select committee (that is, of *state* legislators and computer people; county supervisors and tennis-shoe ladies are OUT) could be invoked.

From the Editorial Director

Herb Grosch

Professional Practices

It May Not Be Illegal... but Is It Professional?

By Norman P. Kelly
Special to Computerworld

During the past two months I have become increasingly aware that the unfolding history of Medicare data processing services and their operation is giving all data processing a bad name.

It may not be illegal, for instance, to clear a backlog of processing work by dismantling computer safeguards, and simply approving all the 150,000 outstanding claims. Yet a data processing system that handles itself in this way – as Electronic Data Systems Inc.'s (EDS) system apparently did in the State of Iowa – will hardly become popular with hard-pressed taxpayers. I question therefore whether such actions, if true, are really professional.

It is not necessarily illegal to be first to obtain a contract for the study of a state's Medicare/Welfare system, and thereby gain an inner track in later competitive bidding, as EDS is currently suspected to have done in New York. But does this type of conduct bring honor to data processing?

It is not necessarily illegal to run an operation with a 13% error rate – as has been reported by HEW auditors in the case of the State of California; nor to double-bill states for the operation of computers that have not even been installed (New York and Massachusetts); or to cut staffs 50% to hit budget targets (Texas). But should the data processing profession approve such practices, even if only by failing to condemn them?

It may not be illegal to consistently make high profits – reportedly as high as 100% to 200% in some cases – or to inflate claims with regard to work done, as has apparently occurred in the states of Massachusetts, California, Indiana, Iowa, Kansas, New York and Pennsylvania. But is it professional?

Viewpoint

Blaming the Innocents

I want my chosen profession – data processing – to avoid becoming unpopular. I want to avoid blaming innocents and avoid the consequent harm to our profession. I know already that within the data processing profession itself a number of instances have occurred, for example, where previous association with EDS has been used to condemn some of our mutual colleagues. This should not be.

More importantly, I am concerned with the national reputation of data processing. Data processors generally do not appreciate their own importance in the nation.

They do not realize the consequent responsibility that this importance puts upon them to act professionally for the public good.

DP is now touching everything in government and industry. Its proper functioning is essential to young and old alike. We as a profession must play our full part to see that their trust is never abused. But we are not yet doing so.

Action Needed

I believe urgent action is needed. During the past weeks published reports have linked EDS with apparently ignoring Federal election regulations in the 1968 Presidential Election. Gifts of $200,000 were allegedly made to the 1972 Committee for the Reelection of the President while federal Medicare contracts for the states of Ohio and West Virginia were under consideration. (Later they were approved, although EDS was apparently the highest bidder in each case.) Published reports also allegedly link EDS with the use of political influence over data processing contract awards through the intervention of Governor Nelson Rockefeller of New York.

Present Abuses

It seems clear that in the light of the current national situation, both political and economic, considerable publicity is almost certain to occur in the next weeks and months. I believe professional action should be taken to monitor this activity and the data that emerges during it. I believe any such investigations should be examined for possible professional abuses, and the facts should then be presented.

The time to act is now, by announcing that such a watch is in progress. The data processing profession can avoid being thought of as uncaring of the national interest, by acting in a similar way to the California Bar Association which has opened files on the conduct of certain of its members who are involved in Watergate.

We should do the same.

Kelly is the president of National Time Sharing & Data Services Inc. (NTSDS), Buffalo, N.Y. NTSDS has in the past protested the nominations of EDS as a "professed supplier" and the rejection of NTSDS bids in various Federal contracts.

The Professional Practices page is coordinated by Alan Taylor and the editorial department of Computerworld. Articles should be sent to Alan Taylor, c/o the Professional Practices Page, Computerworld, 797 Washington St., Newton, Mass. 02160.

Open Letter to HEW Secretary – Part II

Bureaucratic Characteristics of HEW Are Important

The Taylor Report
By
Alan Taylor, CDP

Dear Mr. Secretary,

When you were quoted about "technological tyranny" and the idea that the HEW Advisory Committee Report on "Records, Computers and the Rights of Citizens" represented "an example of our determination that nothing shall take precedence over an individual's constitutionally guaranteed rights," I am afraid you were being misled by the title and the organization of the report itself.

Perhaps you forgot that HEW itself is a bureaucracy, and therefore most of its products will be designed so as not to unnecessarily embarrass its own leaders – such as yourself – or the organization in its relations with other related bureaucracies (such as the Defense Department) or the public.

This particular report was organized in such a masterly way (and under some rather unexpected circumstances) as to make it very reasonable for you to be misled into talking about "constitutional rights." A close reading of the report shows, however, that your words were somewhat overdone.

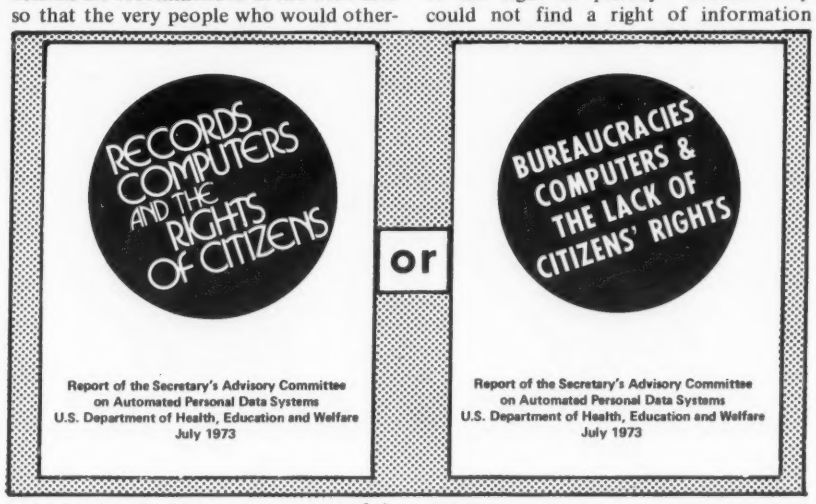
The computers' technologists may have some responsibility – but bureaucracies, and HEW in particular, should also be sitting in the dock on trial with us, rather than acting as prosecuting officer.

HEW Vulnerable

Historically, the advisory committee was chartered when HEW found that it was about to be attacked for failing to oppose the spread of the use of the Social Security Number into the private sector. As the use of the SSN in the private sector involved setting up data banks, Sen. Sam Ervin Jr. said such decisions were matters for legislative decision.

HEW, at the time, had a long record of not attempting to limit the use of the SSN, of providing assistance by way of information about procedures, etc., and so was in no position to avoid a possible embarrassment. Somehow, HEW's course had to be changed – and if possible the history of HEW in the 1960s and early 1970s had to be forgotten.

Bureaucracies have standard ways of handling such embarrassing situations. One of the best ways – referenced in such sayings as "If you can't beat them, join them" and "Stealing their clothes while they were swimming" – is to study a much wider question than the embarrassing area itself, and make a report in which the embarrassment can be hidden in a small section while strong, positive actions are recommended in the wide area so that the very people who would otherwise be enemies become supporters of the bureaucracy.



In true tradition, the charter of the HEW committee called for a very wide, and apparently popular, operation. The embarrassment was coming from the constitutional rights area – so the charter went even wider and called for the investigation of "basic rights." That's even wider than constitutional ones.

The harmful consequences of computers to such rights were to be analyzed. When that was done, another separate analysis was to be made of all the possible safeguards. When that was completed, yet a third analysis was to be performed of the redress methods that would be open to people who had been harmed despite the safeguards.

Only after this thorough study and documentation were any recommendations to be made. And there in the middle was a single section about the HEW and the SSN use.

No Privacy Right Found

Unfortunately, as so often happens, matters got overshot. The charter specified two basic rights – privacy and due process. When they came to study it, the committee could find no legal trace of the harmful consequences of computers to the right of privacy – because they could not find a right of information privacy!

And they found that the danger to the right of due process was coming from government intelligence data banks, not from private use of computers! Attacking such items in the headlines is not good bureaucratic behavior – and the report did not in fact do so, although it did mention the danger on Page 75 of the report.

The charter itself, therefore, became a potential embarrassment. HEW could hardly become the leader for the constitutional right of information privacy if they found no evidence of such a right. And it could not hold out for due process, if the administration was the only known enemy of due process. You might say the game plan to launder HEW was coming unstuck.

Again the experience of bureaucracies in defending themselves provided the answer. If you don't want to answer one question – then answer another one, and say they are the same, even when they are not.

The report, when it came out, changed the work specified in the charter. Instead of analyzing the basic rights, it analyzed the faults of the chosen scapegoat – computers. Instead of admitting there was no defined right of privacy that was being hurt, it said the courts were unsuited to the great task of protecting the individuals (but that HEW was capable of initiating what the court system could not!). What was wanted was some unprecedented legislation, creating new rights but hidden under the concept of compensating for the failure of the courts to grant such a right.

As for the one case which was clear – the due process clause – well, some of the new rights might have to be applied, but some exemptions would be appropriate also. After all, they are government people performing government intelligence missions.

Really, it was a pretty good bureaucratic solution to the problems created by the overwide charter. HEW could still claim a leadership role in the fight, in this case to create new rights. And it could quietly change its course of conduct and start limiting the use of the SSN. It could even put some blame on its own technicians for not having handled their computers properly in the past.

Unfortunately things went a little wrong – and gave the clues to the real situation. The charter suddenly disappeared. It was not printed in the appendices. The attacks on computer tyranny were overdrawn, and in places inaccurate. (For instance, the ANS committee *did* consider the social questions.)

And then action was rushed, without the report being submitted in draft to the professional societies for prepublication critiques. None of these items alone is important – but together they add up to a reason for a careful review of what the

(Continued on Page 12)

From Alan Taylor's Mailbag:

Should Billing Dates Be Built Into Account Numbers?

Many of the letters received by Alan Taylor from data processing people include technical information on data processing as it is practiced which may interest the community. In forthcoming issues such letters will be published in the mailbag, and may be briefly commented on by Taylor. Primarily they are for reader comment, however.

Readers may send comments on points reviewed and on other letters, and send any available technical documentation to Alan Taylor, Alan Taylor & Associates, 633 Central St., Framingham, Mass. 01701, or in care of *Computerworld*.

Dear Alan,

I want *you* to know about this – so here is a copy of a letter I have just written to BT Credit Company in New York – R.M.M.

Gentlemen:

For the last time:

1. I get paid once a month.
2. When I get paid, everybody else gets paid.
3. New bills coming in after I have paid all my old bills go into a folder.
4. Come the end of the month, we go back to Step 1.

Simple, isn't it? Now let us look at it from another direction:

1. I get paid at the end of each month.
2. Bank Americard has decreed in its computerized wisdom that I shall have a billing date on the sixth of each month.
3. Bank Americard, for reasons a mere mortal such as myself cannot fathom, applies an aging process to its bills such that the billing date and the postmark date are a week apart.
4. By the time my Bank Americard statement arrives at mid-month, all old bills have been paid, and all new bills go into the folder until I get paid.
5. Around the time my payment reaches Bank Americard, a new finance charge is being added to my current balance.

"We note with approval the efforts of the Association for Computing Machinery, and of many business firms and newspapers, to provide ombudsman service to the victims of computer errors. We believe the benefits of this approach are many and would like to see it extended to more systems." – HEW Advisory Committee Report

I have explained all this on the telephone. On several past occasions, finance charges have been removed. I have been told in surly fashion by low-paid bureaucrats that nothing can be done about this because "it's on the computer," and *by higher-paid bureaucrats that all would be taken care of, including issuing a new card with a new billing date.* **ATMB/1**

It seems that some brilliant soul decided that untold milliseconds of computer time and vast amounts of tape and disk storage could be saved by *building the billing date into the account number,* **ATMB/2** resulting in a classic case of "damn the customer, let's make it easy on the machine." So my telephone calls and the letter I sent in a few months ago have accomplished the reversal of several finance charges [how much do you think handling the calls, the correspondence and the reversal transactions cost you vs. the savings of all those milliseconds and storage?] but no one has addressed themselves to my request for a new billing date.

So the hell with it. Feed the remnants of my Bank Americard to your computer, or better yet, your system analysts. And please reverse the current finance charges. And, lastly, please delete all reference to my account from your files. I wouldn't want to take up any more space than necessary; just think of all the time you'll save not updating my records anymore.

Sincerely,
Richard M. Mendes

(Or, as I am better known to you: "4250-122-085-522 (Retired)"

Taylor Comments

Two points in this letter should be investigated by the technical community:

ATMB/1: What is the responsibility of a firm whose employees *promise* some action which does not then take place? Should there be a form of liquidated damages (say $100 for each billing cycle before a promised charge occurs) for misleading customers? (In commenting, please quote ATMB/1.)

ATMB/2: Is the practice of including billing dates in account numbers a cause of inflexibility? Should it be discouraged or banned? Or is it all right? (In commenting, please quote ATMB/2.)

HEW as Bureaucracy Must Be Considered

(Continued from Page 11)

document actually says – instead of what it appears to say. And, as I have explained, the two are very, very different.

As secretary, you have to rely on the work produced for you by the HEW bureaucracy. I can see how you came to put technicians into the dock – but seriously, I feel that a better place for both technicians and HEW currently would be reviewing the report in detail together (it has many excellent features and is very useful).

That is why I asked you to initiate a conference on methods of preventing information abuse. We all agree that some abuse is occurring – but until we gain knowledge on various types of abuse (such as those detailed in the first part of this open letter [CW, Aug. 8]) and on how to make redress when they do occur, we will not get much further.

In brief, Mr. Secretary, I would like to see the charter of the committee performed and published.

Is there any reason why this should not occur?

Very truly yours,
Alan Taylor, CDP, CDE

P.S. As you will see above I do like much of the report. One recommendation regarding the extension of ombudsman-type services will be implemented through the Alan Taylor Mailbag.

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A Surprising Comparison

INSCO vs. NCSS

Choosing a timesharing service isn't easy. There are a profusion of suppliers offering a wide range of services at widely varying prices. To help cut through the confusion, we offer this first in a series of comparisons between INSCO: Timesharing and other major services. In addition to the latest published prices available, we also compare commonly accepted criteria for selecting a service.

COST	NCSS*	INSCO	Per Cent Savings
Per CPU Second (256K Machine)	$ .38	$ .27	29%
Connect Time (10, 15, 30 Characters/Second)	$10.00	$8.00	20%
Disk Access (Per 1,000)	$ 1.00	$ .61	39%
Disk Storage (Per month per cylinder where cylinder equals 125,000 characters)	Sliding Rate $20.00-$10.00	Flat Rate $10.00	0-50%

*Based on Published Price List Dated April 16, 1973

Programming Language

INSCO
All major programming languages are available, many with proprietory INSCO features.

NCSS
All major programming languages are available, many with proprietory NCSS features. Many special application languages are also available.

Technical Support

INSCO
Complete program development, debugging and checkout services are offered. A 150-man application support staff backs up the technical consultant assigned to your account to help with training, operations and special problems.

NCSS
Program development, debugging and checkout services are offered. The systems development staff averages seven years' experience in time-sharing systems.

Availability

INSCO
Service is available through a nationwide network of 30 centers.

NCSS
Service is available through a nationwide network of 16 centers.

Reputation

INSCO
Sales in 1972 were over $20 million. INSCO's Staff was among the first to provide time-sharing for major commercial applications.

NCSS
Sales in 1972 were over $16 million. NCSS was the first to make Model 67 available in a successful time-sharing system.

Take advantage of INSCO's surprising capabilities. Call Lee McDermott or write us for complete information.

INSCO Systems Corporation
3501 Route 66
Neptune, New Jersey 07753
Tel: (201) 922-1100

Name & Title
Company
Address
City, State & Zip
Telephone

INSCO

Random Notes

GE Gives Users Data 100s For High Speed Operations

BETHESDA, Md. – General Electric will provide a Data 100 Model 70 terminal free to any users of the Mark III remote computing network who sign a six-month contract and bill more than $2,000/mo for high-speed service. Transmission rates of 2,000 bit/sec are now available. High speeds are planned, the company said.

For the slower paced, GE has added a CALL COMMAND which allows users to turn on remote paper tape readers, access selected processing programs, read the data from the remote units and then turn them off.

Valves Picked, Noise Predicted By $100 Package for Engineers

MARSHALLTOWN, Iowa – Engineers may save 80% of the time needed to size a control valve and predict its noise level, with a $100 Fortran IV program from Fisher Controls Co. The software takes 56K with overlays.

The program selects a valve design based on general service conditions of an application, then compares a predicted noise level to specified allowable sound pressure levels (SPLs). If the original design choice exceeds the allowable SPL, the Fisher routine selects alternative valve designs or noise abatement equipment.

Mark IV Beats Cobol 3:1

CANOGA PARK, Calif. – Informatics claims that users of the fourteenth release of Mark IV have surpassed Cobol execution times by as much as 3 to 1 in typical situations. In addition, programming requires no more than 20% of the effort needed under Cobol, the company said.

To back its claims, a spokesman cited a Tennessee chemical firm that ran a job in eight minutes with the new Mark IV, although it had taken 35 mintues before the rewrite. An appliance manufacturer cut a job from 233 seconds to 23 seconds of CPU time on a 370/155, Informatics added from 21050 Vanowen St., 91303.

T/S Net Opens San Diego Office

SAN DIEGO, Calif. – Time-sharing and remote job entry (RJE) services, including APL, an APL-based application library, and Administrative Terminal System (ATS), are available through local dial-up to the newly opened branch office of Proprietary Computer Systems Inc.

Spokesmen indicated there are nearly 2,000 application programs in the public library and that knowledge of the intricacies of APL is not needed to utilize most of them. The local branch, 591 Camino de la Reina, 92108, handles all communication between San Deigo and the PCS computer center in Van Nuys.

Planning Committee Gone

'New' Newsletter Links User, Codasyl

By Don Leavitt
Of the CW Staff

MONROEVILLE, Pa. – After a fine first issue, a second marred by too small type, a third two months late, and a fourth that was never published, the *Codasyl Newsletter* has reappeared to tell the world what the Conference on Data Systems Languages (Codasyl) has been doing and what it's planning.

The fact that the *Newsletter* has come back – apparently in good health in 24 pages of good-sized type – is seen by some observers as more significant than anything this particular issue contains. It does include, however, a good bit of information, often providing details about items that have appeared only in capsule form elsewhere.

Planning Committee Dropped

Though harder to read, the "minutes" sometimes contain more significant news than the technical descriptions of what various committees have done in their areas of responsibility. A recap of Executive Committee highlights, for example, shows that the Planning Committee has been dropped from the organization "even though a few user association representatives were still actively participating."

The Executive Committee argued "a planning function is hard to staff" and the *Newsletter* had in fact become an effective substitute for the publicity function of the planning group. And so, the *Newsletter* has apparently become an integral part of Codasyl and user interaction takes on added significance.

The *Newsletter* started last summer with the expressed goals of making Codasyl's inner workings more visable, and making users aware of Codasyl's interest in their views. Some 2,000 users accepted the invitation to "subscribe" to the free publication, which was expected to be a quarterly.

From now on, it will appear irregularly and there is no mention in the current issue of the proposal put forth by one of the early subscribers that cost of the publication actually be underwritten by its readers through some sort of associate membership in Codasyl.

Continuing the pattern of featuring the background and current work of one particular committee in each issue, the current *Newsletter* focuses on the Data Description Language Committee.

The issue devotes considerable space to the work to be done by the Operating Systems Command Language task group which has been reactivated to study the possibilities of a Job Control Language common to many operating systems [CW, March 28].

User opinions are also solicited about decision tables. Jonas Rabin, Western Electric Engineering Research Center, outlines his task group's thoughts on the subject.

The *Newsletter* explains the details of how collating sequence – the choice of Ascii, Ebcdic or some other code – can be specified within a Cobol program. This feature apparently will be part of the new Cobol standard, but little more than its existence and its potential for supporting program transferability had been previously available [CW, May 16].

Copies of the *Newsletter* can be obtained from Codasyl, P.O. Box 124, 15146.

'Datacom' Data Base Manager Stresses Aid in Teleprocessing

DALLAS – With the Datacom data base management/data communications system from Computer Information Management Co. (CIM), both DOS and OS/360 users can develop, implement and process batch and on-line applications that are logically compatible with IBM's Information Management System (IMS).

Datacom accepts IMS Data Language/1 (DL/1) statements as well as providing as a user option other terminal and file handling capabilities. The teleprocessing control portion of Datacom is CIM's previously developed and now enhanced GMT package.

GMT is a system of macro-instructions generated by the user to meet his specific requirements. It is capable of concurrently processing "any number" of programs, providing efficient use of the CPU and responsive TP networks even in high volume operations, the company said.

The system uses a scheduling algorithm that places an application program, which may be re-entrant, relocatable or reusable, into the smallest available task area for processing. GMT schedules and allocates all resources to achieve maximum efficiency and utilization, the spokesman continued.

The data base management portion of Datacom supports up to 240 logical files, including fixed or variable length data storage with optional data compression and expansion.

Datacom links the key elements, which need not be contiguous, to produce the search argument. This approach permits access at the data element level, and allows a generic search capability.

The system design of Datacom itself tends to make it more effective than other data base management packages in handling sequential files, CIM claimed.

Datacom requires a minimum 96K 360/30 but more typically would operate in 128K or 160K bytes. The DOS version can be licensed for $40,000, the OS version for $50,000, with lease plans also available.

CIM is at 325 Oak Plaza Bldg., 3707 Rawlins St., 75219.

Package Customizes Payroll Processing For Multiple Firms

ORLANDO, Fla. – Data centers offering payroll service can handle multiple clients in a single processing cycle with the General Purpose Payroll System now available from Florida Software Services Inc. (FSS).

The package provides the programs and procedures to process a payroll system by employee, department, division or company. Facilities are provided to create and then maintain all required files. The package also includes a labor distribution subsystem, FSS said.

Under its multi-company master file support, the system allows each unit being processed to choose its own pay cycles, special payment plans, deductions or other miscellaneous options. It can be tailored so that individual employees within a single company may be exempt from time card reporting.

Individuals can be scheduled for as many as 15 company deductions in any pay period, but any of these may be overridden on any cycle. Federal and state taxes can be withheld using standard rates, special percents, flat amounts or combinations of these options.

Optional Portion

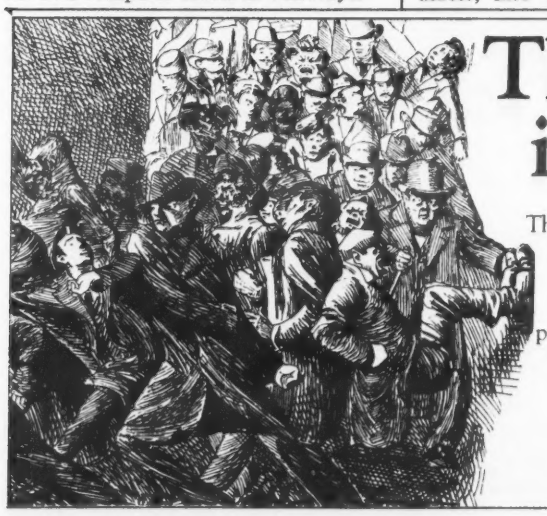
The labor distribution portion of the payroll system is optional by company. It enables the client company to allocate time and cost to various projects, cost centers, customers or any other control group for which this sort of accounting is desired.

Companies that select this option may assign a standard labor distribution number of up to 15 digits to each employee. Time card entries also carry a 15-digit labor distribution number field and multiple cards can be submitted if an employee worked on more than one reportable project.

As with most FSS packages, this payroll system operates in 24K bytes and is written in ANS Cobol. Source programs are usually delivered on 9-channel, 1,600 bit/in. magnetic tape, but can be prepared on punched cards or the user's disk pack, spokesmen said.

The package costs $3,800 until Oct. 1.

FSS can be reached through P.O. Box 2269, 32802.



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Two Approaches, but...

'Buyer Beware' Still the Rule in Custom Software

By Elliot Raphaelson
Special to Computerworld

Custom software firms can provide very effective services, but the user will get the greatest value only if he develops appropriate criteria for both the selection and utilization of the custom shop.

There are situations in which a user can utilize a custom house effectively in a Time-and-Materials (T&M) environment. In these cases, the vendor bills the user – at predefined rates – for all employee and machine time, and for out-of-pocket expenses incurred for the user. Time can be measured in hours, days, weeks, months or years, based on terms of the contract negotiated.

In general, a user should accept a T&M contract only when the problem cannot be broken down into tasks which are definable in discrete time units. If there is a need for T&M work, several factors should be considered carefully.

Check Financial Status

The user should examine closely the latest financial information available on any proposed vendors. Reference checks should be made with several clients for whom the software firms being considered have completed assignments in the last few months.

Another factor to consider is a firm's dependence on one or two customers. The mortality rate is high in the custom software business, and it probably makes sense to avoid firms whose user base is too narrow.

Viewpoint

Evaluation of the people assigned to a project by the software firm should be another major concern. The user should insist on an interview with each worker proposed for his project.

He should ask the employee to bring samples of work he has done on other assignments, and be prepared to question him about that work. Finally he should talk to other clients who have used the particular employee's services.

Fixed-Price Approach

For most program tasks they can't handle in-house, users should consider fixed-price contracts under which the vendor agrees to complete specific, well-defined activities for a stated cost. Often there are schedules for these tasks but compensation is not normally dependent on time frame, unless there are bonuses for early completion or penalties for slippages.

Such a contract will work well when detailed programming specifications have been developed, and computer time availability is known. By asking the vendor to fix-price machine time, the user helps assure that he will be assigned qualified programmer analysts, especially if he gives the software house enough lead time to complete the project.

Before a user enters a fixed-price agreement, he must have documentation and programming standards to make sure of getting the product he wants. These guidelines should insure the use of efficient coding techniques, meaningful tags and labels, and useful comments so the user can maintain the programs.

The vendor should turn over the final product in the same manner the user's own staff would turn over a project to operations, after complying with appropriate acceptance test criteria.

The software house should guarantee its programs for a reasonable length of time, consistent with the user's operating cycle. The firm should not be released from its obligation until the user has run the system in a production environment often enough to be sure it is from a practical viewpoint error free.

Raphaelson is a planner with the Chase Manhattan Bank.

Data Base Features Enhanced in Update Of MRI System 2000

AUSTIN, Texas – The latest release of the System 2000 data base management system from MRI Systems Inc. enhances the definition facilities, the self-contained language, and the capabilities of the procedural language.

New general capabilities include the ability to have 64 concurrently active data bases, variable data base names, error trapping routines for user-written programs, and a customizing of the System 2000 program structure for optimal use in the user's environment.

The user may now redefine his data base definition, modifying element names, key and non-key designations and data types.

Comparisons in the self-contained languages can now match one element against another element as well as literals and data input from a data file.

A RELOAD command allows the master password holder to reorganize his data base with a single command, issued from either a terminal or a card reader.

Procedural language users can now reorder the pattern in which any subset of data has been originally stored.

A special LOAD optimization is now provided to speed data base load times.

System 2000 has been implemented on various CPUs from several vendors, including IBM, Control Data and Univac. It cost $55,000. A "very simple" teleprocessing monitor is also available, separately priced, from MRI, P.O. Box 9968, 78766.

Book Mark

PL/I Is Many Languages

PL/I Programming, by Joan K. Hughes; John Wiley & Sons, Inc., New York; 751 pages, $12.95.

Hughes recognizes that PL/I is both one and many languages. Throughout her well-illustrated hardcover book, she highlights specific differences between a subset (in this case, IBM's PL/I-D compiler) and the full language.

In one appendix, she delves into the Cornell compiler, PL/C. In another, she charts keywords available in various PL/I compilers.

In light of her awareness of various compilers, the limited bibliography (in still another appendix) is a disappointment. It lists nothing but IBM manuals.

More Storage for your buck— In Computerworld's August 29th Supplement.

Our August 29th Storage Supplement will look at a variety of alternatives to more efficient storage, including articles on:

- Virtual Memory: Something for nothing?
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- User experiences with used disk and tape systems.
- Channel operations.
- User experiences with IBM 3330 replacements.
- What to ask when the floppy disk salesman comes calling.

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When that bargain tape loses half the figures in your financial report, here's a note to your regular golf partner.

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COMMUNICATIONS

Data Briefs

Modem Switched to Dial Up If Hardwired Coupler Fails

BOONTON, N.J. – RFL Industries has an acoustic adapter for stand-by or emergency use that will couple a data modem to a direct dialing telephone network when hardwire coupling is not available.

The adapter provides magnetic/acoustic coupling through a standard telephone handset. The unit derives power from the data set, and if the set has a carrier detector stage, the adapter provides visual carrier-detect indication.

The visual indicator may also be used to indicate ready-to-transmit when the set does not have a carrier detector stage. The adapter compensates for the frequency response irregularities inherent in telephone handsets, the firm stated.

The Model HB-34320 Acoustic Adapter costs $60 with immediate delivery from Powerville Road, 07005.

Independent's Printer Matches IBM 2740 Line Code, Control

RALEIGH, N.C. – Terminal Communication's TC-241 keyboard printer is designed for software and hardware compatibility with IBM's 2740 Models 1 and 2 line code and line control.

The 30 char./sec printer supports lines up to 132 or 155 characters wide and comes with two factory-programmed fixed formats that the customer designates, plus a "free form" format.

The printer costs $5,750 or leases at $200/mo, including maintenance, on a one-year lease. Other lease plans are available. Delivery is 60 to 90 days from 3301 Terminal Drive, 27611.

Delta Offers Polling Interface

CORNWELLS HEIGHTS, Pa. – Delta Data Systems Corp. is offering a built-in polling interface option for its Delta 5000 Series video display terminals.

The interface allows a combination of up to 95 Delta terminals or printers at one location to communicate with a central computer over a single voice-grade communications line.

The polling interface option costs $375. The Delta 5000 Series terminals are priced from $3,000 each, depending on model and quantity. Delivery is 90 days from Woodhaven Industrial Park, 19020.

Intelligent Terminals Recapped

PHILADELPHIA, Pa. – An Auerbach guide to intelligent terminals (ITs) provides information on 20 models now available.

The guide contains reports on the IT field as a whole and the basic and special features found in current IT equipment.

The *Auerbach Guide to Intelligent Terminals* costs $19.95 from the publisher at 121 North Broad St., 19107.

Rochester...One Year Later

Carrier Finds Little Interest in NPD

By Ronald A. Frank
Of the CW Staff

ROCHESTER, N.Y. – Although one year has passed since the installation of the first Network Protective Device (NPD) by the Rochester Telephone Corp. (RTC), few data users have chosen this interconnection method.

The NPD was part of an innovative interconnection plan designed to improve on the Bell System's Data Access Arrangement (DAA). It was proposed by Rochester Telephone and approved for intrastate use by the New York Public Service Commission.

The NPD made sense in 1972 because it allowed a user to go to a non-Bell modem and save considerable money compared to the Bell 103, according to Dr. Vincent Swoyer, director of the computer center at the University of Rochester.

But today, with the availability of the Bell 113 data set, Swoyer doubts that a move toward interconnection would be warranted, at least from a cost standpoint. The Tuck Electronics modems that were selected over the Bell 103 might not look like such a good deal today compared with the 113, he said.

The University of Rochester was, and still is, one of the largest NPD users in the area served by RTC. "After all the hassling we have had with the phone company, we would have to think twice about doing it again," is the way Michael Armstrong described the university's experience with the NPD and the RTC interconnection plan.

Armstrong, who is assistant director for systems at the computer center, is especially bitter about the way RTC has administered the NPD plan. "The telephone company has not lived up to the spirit of the tariff," Armstrong said.

As an example, he described the university's plans to add non-carrier equipment at another time-shared minicomputer site. RTC told Armstrong that they would not be able to mount the NPD closer than several thousand feet from the room in which the non-carrier equipment was to be installed. The university would then be responsible for running the required wires from the NPD mounting point to the equipment site.

The University of Rochester did not select the NPD route without considerable thought. The computer center is innovative to say the least. To operate its time-sharing service, the center has a 360/65 with a Data Products 2365-type LCS box, Telex 3330-equivalent disks, and a Memorex 1270 communications controller. The terminal mix includes Model 33 and 35 TTYs, Hazeltine, Memorex and Bendix CRTs, IBM 2741s, Datel 30s, Cope 1225s, and Portacom portable units.

On the technical side, Armstrong believes the NPD leaves a lot to be desired. The unit, like the Bell DAA, is designed to protect the network and other users from harm being introduced by his equipment, Armstrong said. "But what is protecting my equipment from harmful effects that could come from the network?" he asked.

When the NPDs were first installed with the independent modems, the phone company told the university that it was tying up central office "line finders." What was happening was a busy-out condition which was designed to tell time-sharing users calling into the computer center that lines were busy. But the busy-out signals were also tying up the line finder at the RTC central office, he explained.

"When we had 103s, the same busy-out conditions existed but the phone company never warned the university about the problem," Armstrong said.

On the regulatory side, Armstrong believes the process of holding hearings to consider tariff proposals is a delaying action. "You become very frustrated watching a legislative process grind on and on," he said.

RTC Sees Progress

But officials of RTC feel the NPD tariff has been innovative and helpful. Out of 29 cases where a customer considered the installation of non-carrier equipment, only five decided on the customer-provided units, according to Ron Bittner, district manager of marketing and sales for RTC. Bittner believes most of the 29 "confrontations" with non-carrier suppliers were won by RTC because of the liberal mix of equipment offered by the phone company.

Rochester's NPD – Good or Bad?

An indication of how few non-carrier data sets have been connected behind NPDs or DAAs is seen by RTC statistics. The company currently has about 1,400 data sets installed at 600 customer sites. Of these only 51 have been supplied by non-carrier sources. Included in the 51 are 27 NPDs and 24 DAAs, Bittner said.

The RTC officials feel the biggest benefit of the NPD is that it allows the user to provide his own equipment when the phone company cannot supply a comparable unit.

Credit System Links Merchants To CPU for Quick Yes/No Reply

By Patrick Ward
Of the CW Staff

SAN FRANCISCO – Authorizing purchases with Data Source Corp.'s Model 1131 credit transaction terminals goes over well with merchants and customers and saves them both a lot of time, according to the Western States Bankcard Association (WSBA).

The bank-owned service organization used 30 terminals for eight months as a test in the Bay area.

Gary Weeks, association vice-president for data processing, had few problems with the terminals during the test period: "The reliability has been right at our expected level and we've had very little downtime with them," Weeks said. "That's not necessarily a function entirely of the terminal, but also of our host computer here," he added.

WSBA has an IBM 370/155 and a 370/145 that alternate the workload with the peripherals switchable to each CPU.

Data Source leases a total package to WSBA: terminals, a Nova 1200-based concentrator, concentrator software and communications software.

The concentrator polls 30 terminal/sec transmitting at 30 bit/sec. Data from concentrator to host computer moves at 2,400 bit/sec.

The terminals themselves are simple to operate, Weeks said. After setting switches for the transaction amount and the card's expiration date, the merchant activates the system.

The terminal reads the number embossed on the credit card and the system responds with an authorization or turndown. The terminal does not give a reason for a turndown; an operator with a CRT at the computer center calls the merchant with that information.

Sales clerks need only about five seconds to get an authorization from the terminal, Weeks said. Phone calls to the computer center take "the better half of a minute."

In the trial run with WSBA, the terminals were used with a "zero-floor limit" so that all transactions were checked, not only those above a certain dollar figure.

"Really we see this leading into . . .a full transaction recording device of the type that will be used in electronic funds transfer."

But Weeks wouldn't guess when a full funds transfer system might come into play.

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Bits & Pieces

Cassette System Functions As Paper Tape Replacement

SANTA ANA, Calif. – Minicomputer users with paper tape subsystems can obtain a cassette punched tape emulator that performs all the functions of a paper tape unit at higher speeds and with greater program storage capacity, according to the developer.

The Remex PTE incorporates two cartridge carriers. The dual deck operation allows independent and simultaneous reading and writing from the same unit.

Operation is asynchronous for both recording and reading at speeds from one- to 300 char./sec.

The controller is the same as that used with punched tape units. This means users converting from a punched tape operation do not have to obtain a new controller.

For first time users, the controller can either be obtained from the minicomputer supplier or from Remex.

Price of the PTE unit is $2,395 from 1733 Alton St., 92705.

Nova Users Offered Graphics

HARBOR CITY, Calif. – Users who want to develop a graphics capability built around a Nova minicomputer can obtain an X-Y Recorder Adapter from Megatek Corp, for use with that firm's BP-721 graphics display interface.

The BP-731 adapts the BP-721 graphics display interface output to provide buffered, X, Y, and pen lift signals for an analog X-Y recorder.

Cost of the recorder adapter is $350; cost of the graphics display interface is $1,095 from Megatek at 1526 W. 240th St., 90710.

Floppy Available for Naked Mini

BEDFORD, Mass. – A circuit card interface priced at $200 is available from Innovex Corp. for connecting its diskette moving head mass memory system directly to Computer Automation, Inc.'s Naked Mini and Alpha 16 minicomputers.

A complete floppy disk memory system, ready to plug into a Naked Mini or Alpha 16, is priced at $2,740 from Four Alfred Circle, 01730.

PDP-1s Show Staying Power

MAYNARD, Mass. – Of the 52 Digital Equipment Corp. PDP-1s produced in the early 1960s, 50 are still in operation, according to a DEC spokesman.

Compared to modern minicomputers, the PDP-1 was the computer field's equivalent of the Model T and was designed primarily for scientific applications such as the bubble chamber analysis, done at Harvard University.

Nasa Develops First Aid for Damaged Tapes

HOUSTON, Texas – Nasa scientists at the Lyndon B. Johnson Space Center here have developed a new method of recovering information from heat damaged magnetic tapes.

With older methods, tapes which have been curled or wrinkled by excess heat are restored by carefully rolling them into a tape stack and heating the stack to approximately 150° to 170° F (65° to 75° C) for up to 24 hours, according to Nasa personnel.

But tapes that have been too tightly curled cannot be flattened with this method, they explained.

Their new method is a technique that allows damaged tapes that have been shrunk and curled to be repaired as long as the damage does not extend to layer-to-layer adhesion within the tape roll.

To repair the tape, first a length of double-backed adhesive tape is attached to a smooth, hard surface, such as the top of a desk.

This length must be equal to or longer than the damaged section. An equal length of splicing tape is placed over this double-backed tape, with its adhesive side up.

A thin cylindrical rod, cut at an angle to its axis (to form a sharp stylus-type of point) is used to press and smooth the small sections of the magnetic tape, oxide side down, along the adhesive surface of the splicing tape.

The sharp point is used to unfold curls and wrinkles, and the smooth surface is used to flatten the tape against the adhesive strip.

After the entire damaged section of magnetic tape is smoothed out, it is covered with a splicing tape, the Nasa scientists continued.

The edges of both splicing tapes are trimmed to the width of the magnetic tape. Finally, the oxide surface of the magnetic tape is detached from the bottom of the splicing tape with care to avoid damage to the oxide.

To preserve the recording, the repaired section is spliced into a good roll or cassette for copying. Every effort should be made to complete the copying on the first run, Nasa advised, as fidelity in the repaired section deteriorates with each copy operation.

Before attempting the actual repair, Nasa advised users to practice the procedure on a piece of the same type of magnetic tape that has been intentionally damaged to approximately the same degree.

Users wishing further information on this technique can write to the Technology Utilization Officer, Code JM7, Reference: TSP73-10173,

Nasa said it has filed a patent application for this technique, but said it welcomes inquiries concerning license for its commercial development.

IBM Unveils Bank and Store Systems

Retail Store System Networks Data Points

By Michael Weinstein
Of the CW Staff

WHITE PLAINS, N.Y. – The IBM 3650 Retail Store System announced last week is designed to bring computing power directly to areas where information originates – buying and administrative offices, receiving dock, merchandise marking room, credit offices and point of sale.

Components of the new system include the 3653 Point-of-Sale (POS) Terminal, 3657 Ticket Unit, 3275 Display Station, 3284 Printer and 3651 Store Controller.

Controller at Center

The 3651 is at the center of the system, collecting, recording and updating information from other system components. It is a programmable logic unit with 41K bytes of memory. Memory can be expanded in two 8K-byte increments to a total of 57K bytes.

A disk subsystem uses movable and fixed-head drives for an additional 5M bytes on-line storage capability.

Typical applications include collecting and supplying transaction data, handling credit authorization, entering purchase data, sales audit and printing reports.

Satellite Network

Up to 191 devices – either local or remote – can be attached to the 3651. Additionally, the 3651 can be networked to a larger 370 mainframe – 125 to 168 operating in virtual mode – and thus have several retail store systems acting as satellite systems in a larger network.

The majority of devices tied to the control unit would be 3653 Point of Sale Terminals. These units have built-in logic and memory permitting independent operations such as reading price information – with an optional magnetic wand reader – calculating tax, total amount due and change to be returned. This information is displayed on an eight-digit display panel.

Completed sales data is transmitted to the store controller where the data is used to alter inventory status tables, form the basis of sales reports, etc.

The 3657 Ticket Unit is a batch ticket encoder and printer that produces self-adhering tags (130 tag/min) that can be read by the magnetic wand at individual sales locations.

The 3275 Model 3 video display can be used in management offices, the selling floor and shipping dock for direct visual inquiry and entry into the system.

Keeping a Record

The 3284 is an optional 40 char./sec matrix printer that can be used to produce hard copies of data displayed on the 3275's video screen.

A typical system including controller, four display units, two printers, one ticket unit and one remote communications unit would rent for $2,697/mo.

The point-of-sale terminals and magnetic wand reader will be available for purchase only for $3,575 and $350 respectively. Thus, in this typical system, 80 POS terminals and 64 wand readers would cost $308,400. The entire system could be purchased for $412,690.

First customer shipments are expected in the second quarter of 1974.

Bank System Permits Tailor-Made Net

WHITE PLAINS, N.Y. – The IBM 3600 Finance System consists of on-line keyboard display terminals and printer terminals configured by the user to design an individual teller network.

The 3601 Finance Communications Controller supervises all functions of the system's terminals and controls data transmission between terminals and an IBM host computer – 370/125 through 168 operating in a virtual mode.

The 3604 Keyboard Display Terminal features various keyboards for data entry, a visual display, plus optional reading and encoding of magnetic stripes.

The 3610 Document Reader can be shared between two teller stations to print on cut forms, journal/audit rolls and continuous fanfold paper.

The 3618 administrative Line Printer produces reports at speeds up to 155 line/min.

The 3614 Consumer Transaction Facility is a self-service banking terminal that can be installed to handle customer inquiries and special transactions 24 hours a day, seven days a week.

A typical commercial bank configuration, consisting of six 3604 terminals, a 3610 document printer, two 3612 passbook and document printers, a lobby version of the 3614 consumer terminal, a 3618 administrative line printer and a 3601 communications controller, would have a monthly rental of about $2,295 on a two-year lease.

First customer shipments are scheduled in the last quarter of 1974.

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Possible Patent Dispute

Users Buying 6,250 Byte/In. Tape Drives Cautioned

By Michael Weinstein
Of the CW Staff

Users investigating 6,250 byte/in. tape drives should be aware of possible patent fights that may affect who can supply these units.

While in all probability, no one supplier will be forced to abandon users, users might be well advised to get some written assurances covering support – just in case.

It All Began . . .

In March of this year, IBM announced the 3420 tape drives that essentially tripled storage capacity by incorporating a method called Group Coded Recording (GCR) [CW, March 14].

GCR allowed the new transports to handle tape with a packing density of 6,250 byte/in. compared with the previous standard of 1,600 byte/in.

Soon thereafter, Storage Technology and Telex came out with

Analysis

6,250 byte/in. transports and stated that their respective models were identical to IBM's in everyway but price.

And so it would have remained – another case of IBM announcing and independents counter releasing – if Potter Instruments had not jumped into the picture with the allegation that it was granted a patent in 1965 covering techniques that may be essential in designing the 6,250 byte/in. tape drives.

But Potter is not sure if other companies have used these techniques and Robert Brown, vice-president of Potter, stated it will not know until it gets a chance to physically evaluate the IBM, Telex and STC offerings.

To complicate the picture, Potter presently has its own 6,250 byte/in. drive but will not release it until it has seen the IBM drives to determine if its own drive is in fact totally compatible.

Thus, the question arises as to how Telex and STC can state their drives are compatible if Potter can not.

A supposition presented by one industry observer was that Telex and STC were banking on their ability to change the microcoding in the controller to emulate anything IBM has included in the 3420s.

Microcomputer Aimed at Sensor Application User

EDINA, Minn. – A "microcomputer" for process control and sensor-based applications has been introduced by Comstar Corp.

The Comstar 4 is made up of five elements: a central processor module; a random-access memory system (RAM); a programmable read-only memory system (Prom); a power supply module; and I/O data modules that interface TTL, HTL, DC or AC digital signals and others.

The CPU module sequences instructions in the read-only memory, which can be reprogrammed in the field. Specifications for the processor module are: 45 instructions, 10.8 μsec instruction cycle time, decimal and binary arithmetic modes and the ability to add two 8-digit numbers in 850 μsec. The instruction set includes 15 I/O and memory access instructions, 16 machine instructions and 14 accumulator group instructions.

A printed circuit board holds up to 8 Prom chips (256 by 8 bit words each). Two Prom boards with 16 Prom chips may be installed in the system.

Eight RAM chips (320 bits each) can be mounted on each of the two printed circuit boards in the Comstar 4.

Base price of the Comstar 4 is $995 from 7413 Washington Ave. S., 55435.

Incoterm's Unit Gets Floppy Disk

NATICK, Mass. – Incoterm Corp. is providing its SPD 10/20 Intelligent Display Terminal with a floppy disk subsystem.

The SPD D-250 Diskette is available in a single configuration with a capacity of around 250K bytes or in a dual version with a capacity of around 500K bytes.

Storage medium is a flexible 7.5-in. floppy disk which has 64 tracks separated into 32 sectors. Each sector accomodates 132 bytes – including 128 data bytes and 4 control bytes.

Search time from track to track is 10 msec and average latency is 80 msec. Data transfer rate is 31.25 kbyte/sec.

Standard features include a controller unit, power supply and associated electronics, a control panel and support software.

The SPD D-250 is available for a purchase price of $2,700 plus $25/mo. maintenance for a single unit and $3,700 plus $35/mo plus maintenance for the dual version.

Three and five year lease plans are available at $90/mo and $64/mo and $124/mo and $87/mo for the single and dual units respectively from the firm at 6 Strathmore Road, 01760.

For openers, Systems 2400 can save you a bundle in the dollars department.

For closers, it can save you people headaches when you centralize mainframes.

Start by saving $500 to $1000 per terminal per month, compared with IBM. But compare us to anything you like. System 2400 talks to all mainframes.

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System 2400 is the one communicator that can combine volume data entry through System 2400 key display. What's more, System 2400 can also off-load the mainframe and keep local work local, by combining editing and sorting and printing.

With the new boost in available core to 65k, System 2400 can configure you out of a lot of problems and into some real savings.

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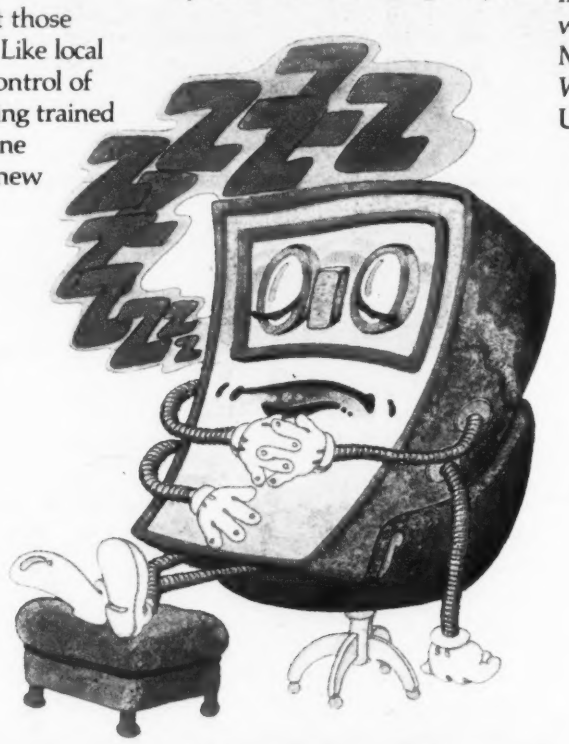
MDS.



If all your communications terminals do is communicate, you could be shortchanged.

1130 User Moves Fortran-Based DP Work to Varian 73

By Don Leavitt
Of the CW Staff

NEW YORK – Totally different business purposes, tempered by good rapport with a hardware vendor, can sometimes lead a user to make nearly the same move for two separate clients. Such is the case with Manamation, Inc., a facilities management firm, which is in the process of shifting two accounts from IBM 1130 to Varian 73 equipment.

For five-and-a-half years, the company has been running a batch-oriented real estate accounting system on a 16K 1130 for Carol Management Co. The move to a 32K Varian 73, explained Manamation President Al Kaskel, will provide Carol with a more flexible, on-line system to cope with an expanding property and tenant data base.

For Treadwell Corp., the shift to the Varian hardware will provide a separation of engineering and commercial applications as half the workload will stay on an 1130, though smaller than the one currently installed. Use of the two systems will be cheaper as well as more efficient than trying to fit everything on a larger 1130, Kaskel noted.

Fortran for Business?

Use of the 1130 for business applications such as Carol's system is perhaps unusual, Kaskel admitted, but it came about

The Small Systems User

naturally as a result of engineering backgrounds among key people at Manamation. More unusual than the hardware choice, however, might be the use of Fortran as the source language for payroll, billing and management reporting applications.

Programming in Fortran is also a carryover from engineering, he added, and though it has caused some problems, it has also helped in converting to the Varian mini, since it too has Fortran capabilities. But the biggest factor in choosing the new equipment, Kaskel said, was Varian's willingness to listen to his problems.

In resystematizing the Carol operations, he felt no need for computing power beyond that of a mini, but he needed a means of supporting a large data base. After reviewing the market he chose Century Data's double-density, double-track disk system as the one he wanted to use.

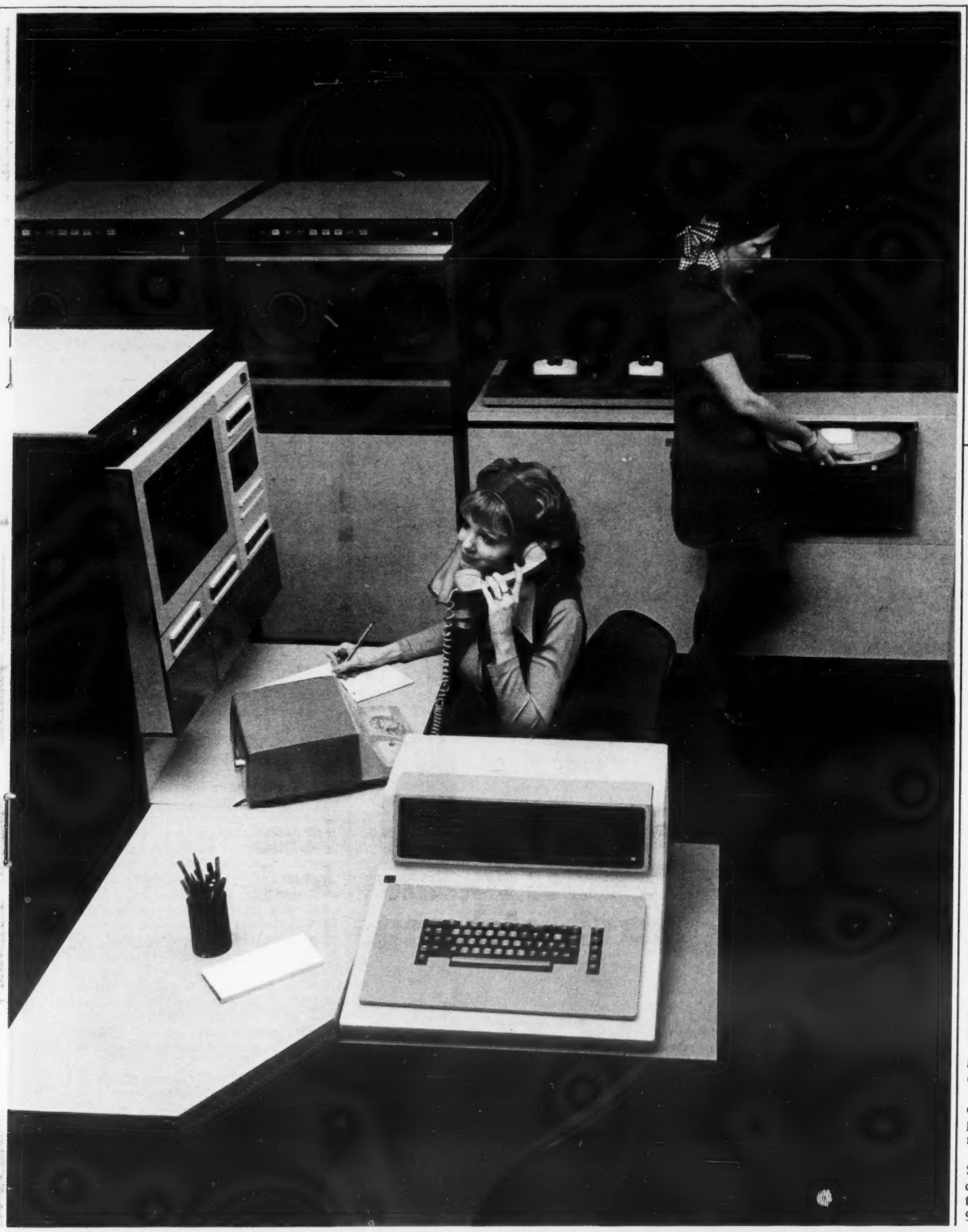
Most of the CPU vendors were unwilling to link such a massive disk facility with any processor as small as Kaskel wanted. But Varian agreed and built the interface.

Varian already had Vortex, "a true multiprogramming operating system" such as Kaskel wanted, but the company was willing to modify the then-current version to provide true random access to the variable length records Manamation wanted to store on the disk. Changes were also made by Varian in its ANS Fortran, which Kaskel said was basically tape-oriented – in common with most Fortran compilers – and therefore no good as a tool for working with the on-line data base.

Dollars and Sense

One of the big problems Manamation has had to overcome in using Fortran for commercial DP – on either the 1130 or the Varian 73 – has been the language's inability to provide mathematical precision down to the dollars and cents accuracy required by accountants, or by an employee whose paycheck is generated by the system.

Kaskel claims to have solved this and to be able to work with larger figures than allowed by Varian's double precision arithmetic, and to use less core in the process than the less accurate vendor-provided routines his is replacing.



Programmable Calculator Gives User Flexibility

BEAVERTON, Ore. – A programmable calculator from Tektronix can be specially constructed to solve individual user problems, according to a firm spokesman.

The key to this individuality is the use of programmable read-only memories (Proms) within the Tek 21 and Tek 31. Users can send Tektronix any program they want incorporated into the calculator in any form: cards, listing, etc.

Build for Own

These user-defined functions are controlled through 24 special function keys on either of the two models.

Basic memory in the Tek 21 is organized in eight blocks. In the standard machine, each block holds 16 program steps – for a total of 128 steps. Additional optional memory is available so that basic memory can be expanded to 256 or 512 steps.

The Tek 31 can be expanded to 8K program steps, 266 data registers, or 2K program steps, a spokesman said.

Compatible peripherals include an X-Y plotter and computer display terminals.

Software included in a standard offering includes a statistics program library and a mathematics program library.

Basic cost of the Tek 21 is $1,850 or $100/mo. The Tek 31 costs $2,850 or $150/mo from the firm at P.O. Box 500, 97005.

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Conference Views Records Management

PHILADELPHIA – "Records Management in the Computer Environment" is the theme of the 18th Annual Conference of the American Records Management Association, to be held October 21-24 at the Bellevue-Stratford Hotel here.

On Monday, tutorial sessions will deal with the use of computers in records management, and records management in the computer environment.

"Cost Justification of Microfilm Applications" is also scheduled.

Tuesday, an advanced panel session will cover "COM as it Relates to Records Management."

Further information is available from conference headquarters, P.O. Box 7446, 19101.

New Director Comments

All Afips Societies 'Must Participate'

By Toni Wiseman
Of the CW Staff

NEWTON, Mass. – Though he considers his job "basically a staff position," Robert W. Rector, the new executive director of the American Federation of Information Processing Societies (Afips), "would like to work through societies, giving them an opportunity to express their opinions and positions on questions of relevance."

Societies/User Groups

Rector strongly supports the view that there is a need for more coordination between Afips and member societies and is therefore "pleased and optimistic" that the Afips board is going to convene during the annual meeting of ACM in Atlanta.

"As chairman, my first priority has to be to ensure the general success of NCC," Rector said. "It's been a major and almost traumatic experience for Afips to go from two to only one show a year." He feels it is a challenge to see that resultant changes in staff assignments do not depreciate the effectiveness of the work.

The second priority, he said, is to effect a closer coordination between Afips and constituent societies. "There hasn't been enough understanding throughout societies that they are members and therefore contributors," Rector stated. "Their membership must be manifest through participation in projects and publications."

This closer coordination would, in Rector's opinion, facilitate his third priority, that of making Afips the spokesman, though not the exclusive one, for the societies and the field.

More Society Involvement

An important area which will be emphasized, Rector said, is society involvement in Afips projects. "I have a feeling that we have had individuals participating and not always societies," he commented. "I would like to see official society participation."

Rector noted that there were three levels of membership in Afips, "layering" the 13 member societies.

The first level includes the association most directly involved in NCC profit sharing, which include ACM, IEEE/CS and SCS. The second level are those societies whose primary interest is in data processing. These societies are Asis, ISA and Siam.

The other seven societies are constituent members. These, Rector said, are the societies which are interested in DP, but which could survive without it.

"Unfortunately," he said, "this layered structure tends to reflect the degree of each society's participation as well, though we try to see that all are represented."

NCC Pattern Established

Looking back on NCC '73, Rector feels a pattern has been set for future NCCs. "Probably the most significant thing accomplished at the past NCC was the expansion of the program in both technical and application areas," he said. "NCC '73 was a success both attendance-wise and financially."

CW Photo by Mary Upton
Robert W. Rector

"While a pattern is being established," he said, "it is important to realize that there is always the individuality factor of the local committee responsible for the conference." As an example he cited the decision by this year's committee, headed by Dr. Stephen Yau, to have only one program chairman instead of two (i.e. technical and applications) and 15 program areas.

Rector is confident of the success of the 1974 conference and pleased by the committee's decision to encourage user participation by soliciting program proposals from the industry at large.

Though he admits the industry is susceptible to "the escalating prime rate," he feels "good vibrations" for NCC '74, noting that more booths have already been reserved for Chicago than were present in New York.

Speculating on future trends in the industry, Rector foresees a continuation of the "old maturity theme. Systems that have been emerging are finally beginning to work," he said. "POS is translating into the real world of retailing, and banking has reached the point where it can no longer operate without data processing.

"The industry is on an upbeat," Rector affirmed.

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Law Course Studies Computers in '70s

NEW YORK – "Law and Computers in the Seventies II," a course jointly sponsored by the American Law Institute and the American Bar Association, will be held Sept. 13-15, at the House of the Association of the Bar of the City of New York.

The course will focus on introducing lawyers to the legal facts of computer use in business, industry and government, and will alert non-lawyers to the types of legal considerations that require attention to forestall or minimize trouble.

Program Contracting

Discussions will cover computers in the security industry, special considerations in negotiating and contracting for computer software programs, and the availability and liability limitations of insurance in the computer industry.

The computer industry in the light of antitrust laws will also be considered.

For additional information contact Paul A. Wolkin, Courses of Study, ALI-ABA Joint Committee on Continuing Legal Education, 4025 Chestnut St., Philadelphia, Pa. 19104.

Bankers Meet to Discuss Funds Transfer, Automation

PORT CHESTER, N.Y. – The Sixth Annual International Conference on Automation, sponsored by the International Savings Banks Institute, Geneva, Switzerland, will be held here Sept. 11-14.

Bankers from 18 countries will discuss worldwide developments in automation and funds transfer.

The conference will be conducted in English, French, and German through the use of simultaneous translation facilities.

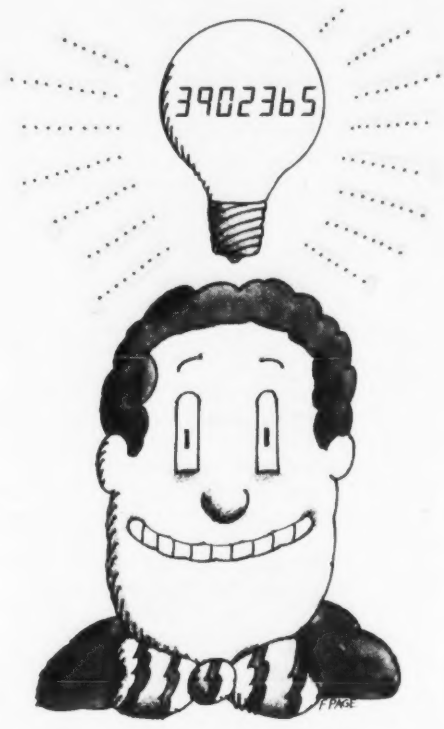
For further information contact Richard E. Pokriefke, National Association of Mutual Saving Banks, 200 Park Ave., New York 10017.

User Group Organized By Health/Beauty DPers

MORRISTOWN, N.J. – Ten firms in the health and beauty aids industry are organizing a computer user group with initial membership to include 25 companies.

The H&BA Computer User Group is intended to bring together computer-oriented systems and EDP operations management personnel to deal with industry problems. The objectives will include mutual exchange of non-confidential information relating to computers and computerized applications, especially where affected by industry-wide or governmental actions.

For further information contact Joseph D. Brockman, temporary chairman, at The Mennen Company, 07960.



What's the going price for a good idea?

WESCON/73 in San Francisco is a power-supply of new ideas—a real-time readout of trends and application—a data bank of what's happening now and what's on the way in electronics.
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More Storage for your buck—In Computerworld's August 29th Supplement.

Our August 29th Storage Supplement will look at a variety of alternatives to more efficient storage, including articles on:

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- Core vs. MOS Memories.
- User experiences with used disk and tape systems.
- Channel operations.
- User experiences with IBM 3330 replacements.
- What to ask when the floppy disk salesman comes calling.

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Training Tied to Known Career Path May Result in More Productive Analyst

COLORADO SPRINGS, Colo. – There is still some confusion about what systems analysis is, and some debate about where the analyst fits into a corporate DP structure, according to Richard Booker, training consultant for Systemation, Inc., but most large installations recognize that the responsibilities of the analyst – by almost any definition – have grown and present job requirements demand more knowledge and skill than in the past.

The possibility of an entire career in systems work, rising to the vice-president level in some corporations, has developed in the past few years, Booker noted, adding that unfortunately training generally has not kept up with this increased responsibility.

Piecemeal Training

At best, he went on, training for systems work has been piecemeal, answering a specific, immediate requirement, but unrelated to the total career development needs of the analyst himself.

Subject	Level	Hours
Organizational Orientation	T	16
Overview of Systems Approach		50
Computer Hardware		40
Application Software		80
Operating Systems		40
Internal Standards		8
Systems Principles/ Techniques In-Depth		60
Data Communications Concepts	J	4
Data Base Concepts		4
Project Management		24
Overview of Management Science	S	24
DP Management		20
General Management		40
Organizational MIS	M	40

Systemation sees a series of courses such as these as necessary to carry an analyst from trainee (T) through junior (J), senior analyst (S) positions and into Management (M).

Systemation is a firm that specializes in preparing seminars for presentation at a user site. Though each seminar covers a specific "curriculum" based on a subject, the case studies with which the Systemation instructors bring the general topics into focus are all based on situations that can be clearly recognized by the user personnel.

The company has applied that approach to systems training as much as it has to other subjects, Booker explained. It has set up a "career path" of subjects that have to be understood before the analyst can effectively go on to the next step.

The critical path is the same for all analysts, he said, even though the detailed content of each course may – indeed, should – vary from user to user, and probably from analyst to analyst.

Develop Full Potential

The objective of the training, in any case, should be to develop the analyst to his full potential for the organization, and at the same time, enable him to achieve his own personal goals, Booker said.

Input to each course is job analysis information developed with the aid of personnel studies, and some sort of definition of where the analyst stands in relation to the perceived needs.

"Output" of this approach should be a knowledge/skills list for each level of each position from trainee, to junior, to senior analyst and on to managerial posts as well.

Tying training to a career path results in a happier, more productive, more loyal employee, Booker said.

This may happen, he went on, because the analyst feels the company cares, but also because the company itself has to stop and define what possibilities in fact lie ahead for the analyst, since the company's money is being committed to the courses.

Systemation is at 1351 S. Eighth St., and can be reached through P.O. Box 730, 80901.

Some Brief Education

AMA Plans 5-Day Refresher Course

ATLANTA – Senior systems executives will be able to take a refresher course in advanced systems and procedures, Sept. 10-14 at the Hilton Inn, sponsored by the American Management Associations.

The meetings will focus on current thinking in management systems technology. Presentations will discuss the organization and management of business systems functions, the implementation of changes and the recruiting and training of systems personnel.

The five-day course has been divided into 14 sessions, ranging from the techniques of systems management within a corporation to systems implementation and evaluation.

Further information is available from Henry Schnierer, Program Director, American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

Slide Course Explains DP to End Users

ATHERTON, Calif. – The ultimate end user of a DP system, the manager in an operating department, can be made aware of his need to become involved in the system design and development through an eight-session course, supported by 350 colored slides, now available from David Katch & Associates.

The $4,000 Management Perspectives for Creative Computer Applications course includes a set of the slides, 10 student texts (paper copies of the slides) and an instructor's guide, (slide-by-slide lecture notes). Katch is at 36 Euclid Ave., 94025.

Can Programmers Be Managed? Ask AMR

CHICAGO – Managing Computer Programming will be the subject of a professional seminar offered by Advanced Management Research (AMR) to be held Sept. 10-12 at the Hyatt Regency O'Hare here, and later in New York and Los Angeles.

AMR is based at 1370 Avenue of the Americas, New York, N.Y. 10019.

Time Series Study Scheduled in Detroit

DETROIT – A course focusing on digital time series analysis will be given here during the week of Nov. 5-9, by the Measurement Analysis and Computation Division of Agbadian Associates.

Aimed at the scientist or engineer working with digital test data or doing digital signal processing, the course covers Fourier analysis, digital filtering, power spectral density computations and other modern techniques. The processing and analysis of both random and transient data will be discussed, an Agbadian spokesman noted from 250 N. Nash St., El Segundo, Calif., 90245.

The Computer Users' Forum and Exposition, English-style

You're invited to see the latest EDP equipment and services during our Computer Caravan tour of the United Kingdom in September.

We extend a hearty invitation to our English and European readers to visit the English Computer Caravan during September. You'll find the user-oriented forums and workshops to be of immediate, practical use–and you'll see the latest EDP equipment and services at our exposition.

Here's the schedule:

City	Dates	Location
Manchester	Sept. 3-5	New Century Hall
Birmingham	Sept. 11-13	Great Hall, University of Birmingham
Edinburgh	Sept. 18-20	MacRobert Pavilion
London	Sept. 25-27	Europa Hotel

The European Computer Caravans
sponsored by
COMPUTERWORLD
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Advance registration is not necessary for the exposition, but is advisable for forum attendees. If you'd like further information, contact:

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COMPUTER INDUSTRY

CI Notes

CDC, Memorex Holding Talks

MINNEAPOLIS – Control Data Corp. is talking to Memorex Corp. and the Bank of America about taking over certain Memorex operations, according to CDC.

However, a CDC spokesman said the discussions do not involve a merger or acquisition.

Under discussion is a possible agreement for CDC to manage and maintain, but not own, leased Memorex peripherals already installed.

The firms are also discussing a plan for CDC to manufacture certain lines of Memorex products, employing Memorex personnel essential for the manufacture, maintenance and marketing of such equipment.

Recently Memorex laid off 300 employees.

NCR Takes POS to Post Office

NEW YORK – National Cash Register Co. has landed a contract for the installation of modified 280 point-of-sale terminals and a one-year rental of a Century 101 computer in the Flushing, N.Y., post office.

"The Postal Service operates the largest point-of-sale business in the country," observed President William S. Anderson. "It offers an ideal application for the automatic transaction concepts which are having a major impact in the retailing industry," he said.

The $678,000 contract for the pilot program, which was let for competitive bidding, calls for multiple terminal installations in early 1974 at 29 postal substations in the Flushing Post Office.

Burroughs, Penril Pact Waning

ROCKVILLE, Md. – Burroughs Corp. has decided to neither market nor manufacture the Credit Authorization Financial Data Information Terminal developed by Penril Data Communications, Inc. and has orally informed Penril of this decision, Penril said.

Univac, Tally Sign Pact

KENT, Wash. – Tally Corp. has signed a manufacturing licensing agreement which allows Univac to produce the Tally Series 2000 line printers.

The agreement also provides Univac with an option to purchase up to 2,000 of the printers.

NCR to Sell Quantor in U.S.

DAYTON, Ohio – NCR has entered into a further agreement with Quantor Corp. to market the 105 Computer Output Microform (COM) system in the U.S.

NCR already markets Quantor units in the international field and provides maintenance service for Quantor equipment in the U.S. The new agreement will supplement Quantor's own field sales and service operations in the U.S.

Sycor, Logabax Sign Pact

ANN ARBOR, Mich. – Sycor, Inc. has acquired the rights to manufacture a matrix printer from Logabax, S.A., a French minicomputer manufacturer.

The printer, which operates at 40, 80 and 165 char./sec, will be offered for use with the Sycor 250 terminal.

First deliveries for both the printer and the 250 terminal are scheduled for the fourth quarter of this year.

Okidata Acquires Memory Unit

MOORESTOWN, N.J. – Okidata Corp. has acquired the Computer Memories Division of Applied Magnetics Corp., and has begun exports to Japan of disk memory units manufactured by the Computer Memories Division, according to David L. Nettleton, president.

'Fully Competitive' by 1975

Japanese Ready Entry to World Market

By E. Drake Lundell Jr.
CW Washington Bureau

WASHINGTON, D.C. – The Japanese computer makers may be launching a full-scale invasion of world computer markets earlier than many U.S. firms expect, and to meet that threat the U.S. computer industry probably may need more governmental supports, similar to the support the Japanese Government gives its computer industry.

Those are two conclusions that can be drawn from a recently released report by the now defunct computer technology resources panel of the Computer Science and Engineering Board of the National Research Council.

Beware 1975!

While many U.S. industry figures have predicted growing competition from Japanese firms by the early 1980s, the board warned that the Japanese will probably be fully competitive by 1975.

"We believe the Japanese intend to, can and will make a full-scale entry into the world's computer markets – particularly the big markets of the U.S. and Western Europe – by or prior to 1975," indicated the group, which was headed by Dr. Donald Ling of Bell Telephone Laboratories.

"We believe they will be able to offer the whole spectrum of machine sizes and a full complement of peripheral gear, fully contemporaneous in hardware, software and system adaptation to use," the group added.

In addition, the study committee claimed "the equipment will be of very high quality and reliability, easy to maintain and very competitively priced.

"This raises the possibility that U.S. computer manufacturers are going to have a difficult problem meeting the competition in our country's domestic and foreign markets," the group warned.

A large part of the predicted success of the Japanese firms will come from the backing they are given by the Japanese Government, particularly the Ministry of International Trade and Industry (Miti), according to the report, which noted that Prime Minister Tanaka formerly was chief of Miti.

"Miti has set an explicit national priority on computing systems and the electronic data processing arts generally (e.g., software systems, systems development and management, etc.)," the report stated.

'Excellent Prospects'

"In Miti's view, computers represent the sharp cutting edge for entry into the new emerging phases and forms of the Japanese society; in addition, there is an excellent prospect within a few years of gap-closing efforts for substantial foreign markets," it added.

The panel, in an observation which it said was of "great importance," noted that in the U.S. there was no such industry government collaboration in technical or manufacturing areas.

"For U.S. manufacturing industries as a whole there is no general national planning and coordination function, and only limited incentives to offer for U.S. industry cooperation.

"In an era in which the rate of growth of the U.S. economy is slowing down and when the U.S. balance of trade has for the first time in decades turned unfavorable, we find the Japanese Government-industry cooperation to be especially intriguing as one means of assuring national resource programming and management," the group said, although it admitted that the Japanese example could not be adopted here because of differences in culture and laws.

"We do feel, however, that some suitable indigenous structure, perhaps more modest in its aims, could be erected to fill what we think will be an ever-increasing need if the U.S. is to continue to compete effectively in foreign markets and to protect its own market without the use of protective tariffs," the group stated.

Economist's Viewpoint – Part II

Barriers to DP Industry Cited

By E. Drake Lundell Jr.
Of the CW Staff

CAMBRIDGE, Mass. – The computer industry is basically an extension of the punch card and tabulating machine industry "with a major technological change," according to a recent Harvard doctoral thesis, and as such has been concentrated since its beginnings.

In addition, the industry exhibits many characteristics that help blockade the entry of any new firms on a major scale, according to the thesis by Dr. Gerald Brock.

The primary barrier to entry is in the area of product differentiation, he said, indicating that "differentiation arises both from differences in brand identification and service reputation and from real physical differences in the machines.

"Because the customer makes a large investment in programs specialized to his use on a particular type of machine, he is effectively eliminated as a potential customer of a manufacturer which does not make provision to translate the customer programs or provide a machine on which the existing programs can be run," he noted.

"The customer's dependence upon the manufacturer also serves as a barrier to entry because the customer is reluctant to purchase from a new manufacturer who is less certain to remain in the industry than the established suppliers," he added.

Because of the time required, the capital costs are high to any potential new entry into the business, Brock said, indicating that a minimum of $1 billion was required for any effective entry by an integrated supplier.

"The high capital costs, product differentiation barriers and uncertainty of making a profit in a fast-changing industry dominated by one firm, cause entry to an integrated business-oriented firm to be effectively blockaded," Brock said.

Entry into the business, he said, has come primarily at times of technological change in the industry as it evolved from the punch card and tabulating machine business.

"The switch from electromechanical to electronic technology (beginning of computers) brought in Burroughs, NCR and others who later failed," in addition to IBM and Remington Rand who were competitors in the tabulating machine market, he noted.

"The switch from vacuum tubes to transistors brought in Philco, GE, RCA, Control Data and SDS. The technological changes since transistors have been less dramatic and no entrant has made it into the group of major IBM competitors since the transition to transistors," Brock observed.

But in the "specialized segments of the industry – minicomputers, peripheral equipment makers and software and services – entry is relatively easy and there has been continual entry and exit of a large number of firms in these segments," he added.

In this concentrated structure, the only apparent constraint on IBM pricing has probably been the threat of antitrust action, according to Brock.

According to a profit maximization model developed by Brock, "IBM's long-run profit maximizing strategy . . . was to drive out all competitors from the market and then price at the limit price.

"In order to simulate actual conduct in the industry, a discount rate of 35% was necessary" for IBM to accomplish this goal according to the model, he said.

However, it is likely that IBM has not followed this practice, he said, because it sees "a market share constraint from the antitrust laws.

"A goal consistent with observed behavior would be to maximize profits subject to the constraint that average market share is not greater than 70%," he said.

"With that goal, maintaining an exact profit margin would not allow the maximum profit," he noted, but added that "the differentiation of computers across generations even within the same manufacturer allows IBM to practice price discrimination; it can offer lower prices on new equipment to induce new or dissatsified users to come to it while retaining higher prices on old equipment for satisfied customers."

However, he found, "this practice causes a variation in market share, rising with the introduction of a new line of equipment and falling toward the end of the equipment's life, but the average share has remained fairly constant."

This constraint on the part of IBM, and the absence of collusion in pricing, "cause a more competitive industry than would be expected from the structure," Brock noted.

This is because "IBM has no incentive to lead in price-cutting after a technological advance and must be restrained in reacting to competitive moves."

To do this, IBM focused on software and services, he said, in order to take advantage of these two areas where the firm's size gave it an advantage over the competition.

"This attitude increased the natural product differentiation of the industry," he said.

Adapso Suggests Cox Look Into U.S.-IBM Antitrust Trial Delay

NEW YORK – The Association of Data Processing Service Organizations has reiterated its request for a speedy trial of the IBM-government case in a letter to Attorney General Elliot L. Richardson, asking that he seek invocation of the Expediting Act.

In his letter, President Thomas J. O'Rourke suggested that if "external influences" are delaying implementation of the trial, this matter should be turned over for investigation to Special Prosecutor Archibald Cox.

O'Rourke noted the association had made an identical request for use of the Expediting Act a year ago, and had also asked that the litigation be given adequate resources.

The letter noted that "there have been suggestions in the record of influence external to the Justice Department" citing a government memorandum dated June 5, 1973, filed on June 12 wherein "confidential informant claim or privilege is asserted with respect to two documents passing between the Department of Justice and the President and his staff . . . "

He noted that the litigation was filed in the closing days of the Johnson Administration and an "early public statement by at least one high official of the Justice Department before taking office has indicated a view favorable to the defense."

Upcoming Trade Show Season Promises Wide Variety

By Toni Wiseman
Of the CW Staff

NEWTON, Mass. – This year's fall season of trade shows promises to be an active one, both on the domestic scene and abroad.

The Western Electronic Show and Conference (Wescon) is scheduled to kick off the season Sept. 12-13 at the San Francisco Hilton.

More than 300 exhibitors will be at the show including Wang Laboratories, Xynetics, Digital Equipment Corp. and Hybrids Systems Corp. C.A.S.I.O., Inc. of Japan and several German manufacturers will also be exhibiting.

Russians Are Coming

The Russians will be among the 1,500 exhibitors at the 24th International Exhibition of Data Processing, Communication and Office Organization (Sicob) in Paris, Sept. 19-28, where data processing systems, peripherals and remote systems will be on display.

A strong representation of computers and microfilm equipment is expected as these are the two growth fields in Europe at present, according to an exposition spokesman.

The Middle Atlantic region will be hosting the 7th Annual Instrumentation and Computer Fair, Oct. 3-4, in Washington, D.C.

More emphasis is expected to be on minicomputers and peripherals and less on instrumentation exhibits than in previous years. Data General, DEC, Tektronix and Honeywell are among the companies which will be represented.

Minicomputers will be the main thrust at the Business Systems/Product World Exposition at the New York Coliseum, Oct. 8-12, according to an organizer. Seiko of Japan and Nixdorf of West Germany will be exhibiting along with domestic companies. Several software producers will also attend.

More than 70 exhibitors have booked space at the Canadian Computer Show, Oct. 16-17, in Toronto, covering 28,000 sq-ft of display space.

Bunker-Ramo, Cambridge Memories, Hewlett-Packard, DEC, Control Data, Singer Co. of Canada and Greyhound Computer are among the exhibitors.

The Data Processing Suppliers Association will be sponsoring Input/Output Systems '73 in Chicago, Oct. 16-18. Exhibits will cover applicable equipment in terms of total input/output systems with Control Data and Computer Machinery Corp. among the exhibitors. Potter Instrument will have its new System 85 diskette on display, and Gould, Inc. will be showing its communications terminal and a remote/off-line printer.

IBM, Univac, Honeywell and Control Data will be among the 40 odd companies represented at the Export to Japan Trade Fair in Chicago, Nov. 6-8.

Prospective buyers from Japanese industry and government will be there to consider data communication equipment, minicomputers, peripherals and software.

Power Supply Knowledge Needed

LOS ANGELES – The role of the facilities manager is expanding to include knowledge and supervision of power supplies, according to a recent report by Darling & Alsobrook, a consulting firm.

"The uncertain behavior of power sources, the complexity of digital equipment and the integral role such equipment is playing in many sectors of industry all lend a new importance to the facilities management expert," according to Berne Fisher of Darling & Alsobrook.

There is, also, a growing need, he said, for a "new breed" of engineers who can interface effectively with the power companies. "These specialists are capable of determining the actual power loads and the failure problems in the geographic area of the DP installation," he added.

In planning a new installation, the user needs to know what other buildings will be connected to his power line, what kind of equipment each other user has, and what the impact might be on his equipment under the worst case load conditions, he added.

This type of information is needed in order to determine whether an isolation transformer or an uninterruptible power system will be needed.

In addition, he noted, the problems are especially severe when minicomputers are involved "since they tend to use expensive power supplies which are more susceptible to problems created by line transients."

Orders & Installations

Control Data has purchased a Model 1155 computer performance measurement system from Tesdata Systems Corp. to measure the efficiency of its internal corporate computer systems in the Comsource Division. The systems to be measured are the CDC 6000 Series, Cyber 70 Series and 3000 Series.

Genesse County Division of Water and Waste Services, Flint, Mich., has installed a 160K accelerated 360/30 from Computer Hardware Consultants and Services, Inc., to be hooked into Trivex equivalent 2260's used in analyzing sewer usage.

J.W. Mays, Inc., New York department store chain, has purchased 800 MDTS electronic POS terminals and eight System Ten computers from Singer Business Machines, for a retail information system.

Publishers Paper Co., Newburg, Ore., has ordered a Measurex Series 1000/ Model 85 computer control system for its newsprint machine.

H and S Bakery, Baltimore, has ordered a Univac 9480 system for route accounting, bake estimates, inventory control, general accounting and payroll processing.

Good Samaritan Hospital, San Jose, Calif., has installed data transmission equipment from Analytical Development Associates Corp. (Adac) which links them to Adac's Mednet System, enabling them to record and transmit patient test data for processing by Adac.

Union Bank, Los Angeles, will be using Trilog's Profit Sharing System (PSS) for processing the participant accounting needs of employee benefit trusts.

Richman Brothers Co., Cleveland, has purchased two Model LC-2 computer-controlled laser fabric-cutting systems from Hughes Aircraft Co.

The State of Arizona plans to install a Honeywell Multics system, which operates on a Model 6180 computer, for use by 13 state agencies. The Arizona network will be completed in 1975.

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A unique, new software package we call UCC FIFTEEN makes restarting a job a matter of seconds rather than hours.

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☐ UCC TWO (DUO 360/370) lets you run your DOS programs under OS without conversion. Over 170 in use today.
☐ UCC TEN (Data Dictionary/Manager). Centralizes, controls data definitions, automatically generates data base control statements, facilitates new systems design.
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Report Predicts 360/20 Swing to 3/15s

NEWTON, Mass. – There are over 20,000 IBM System/3s installed worldwide, and "no limit appears in sight," according to *EDP Industry Report*, an International Data Corp. publication.

The report foresees a sharp swing on the part of 360/20 users to the new 3/15 while "sidegrading or actually downgrading in cost." The report noted the installed base of 20s has dropped almost 30% in the last two years.

In addition, about 85% of the more than 10,000 360/20s installed are on rental, the report said.

Rental rates for System/3s vary from less than $1,000/mo to over $6,000/mo.

Their distribution in the marketplace is generally different from that of general-purpose computers, the report found.

The largest market for System/3 is wholesale, accounting for about 15% of the installed base. In addition, nearly three times as many System/3s are installed in wholesale businesses as general purpose computers, the report said.

Almost one-and-a-half times as many S/3s as general-purpose computers are found in retail, transportation carriers (excluding airlines), medical, health and "other" services. All these categories account for another 15% of the installed S/3 base.

Industrial companies account for nearly half the S/3 base in the U.S., versus only one-third for other general-purpose machines. Most of the machines are used by small manufacturers in "miscellaneous" categories.

Governments, assorted business services and "other" financial areas total about 15% of the S/3s, a slightly lower penetration than by computers in general.

S/3s are outnumbered by general-purpose computers in the sector occupied by banking, insurance, airlines, utilities and education. There are only about one-third as many S/3s in these areas as there are other machines. This sector comprises about 10% of the market, the report indicated.

About 90% of all systems are used primarily in a batch, stand-alone environment, IDC estimated, and IBM "seems set on changing this," the report observed.

About 35% of the systems installed rent for $3,000/mo or more, according to the report, suggesting that the tag of $4,500/mo for the 3/15 might not be the "giant step" it seems.

The highest percentage (20%) of the installed base falls in the $2,000-to $2,500/mo range, while units in the $1,500-to $2,000/mo range and the $3,000- to $3,500/mo range both run at about 18% of the installed base.

Railroads Prefer 360/20 CPUs

WASHINGTON, D.C. – The 360/20 is the single most popular computer model among the 78 railroads surveyed by the Association of American Railroads. Of 248 CPUs, down from 253 last year, 32 were Model 20s, followed by 28 Model 30s.

The 360/40, with 19 installed units, ranks third, barely ahead of the 370/155, which totals 18 installations.

There are 13 System/3s, the group noted.

Meantime, the 1400s are still in evidence, numbering 16.

RCA/Univac outranked all other makers, with 25 installed CPUs, of which eight are Univac 9200s, according to the survey.

GE ranks third in vendor popularity, with 13 machines; Honeywell has 10; NCR, 7; Collins, 6 and Burroughs, 3.

The systems are located at 124 sites, with 30 railroads having sites containing more than one CPU.

Document Retrieval To Grow 33% in 1973

WHITE PLAINS, N.Y. – The market for automatic document storage and retrieval (Adstar) equipment will grow 33% to $42.8 million in 1973 from $32.3 million in 1972, and reach $134 million by 1977, according to a report published by Knowledge Industry Publications.

The computer industry can find a significant emerging market for its products in the Adstar area, the report noted. The combined size of the supplier market will grow from $36.4 million in 1972 to $146.8 million in 1977, the study added.

Supplies include components, such as minicomputers, keyboards, CRT terminals, and film, microfilming services and maintenance.

Reasons for the expected growth include the fact that "computers and CRT displays have accustomed information users to fast retrieval of information in nonprint form, and the fact that for many applications Adstar promises significant cost savings over highly computerized systems," the report stated.

In addition, there are more than 14 million clerical jobs that are targets for automation, the study added.

DP Keeps Tabs on Gas

Special to Computerworld

SYDNEY, Australia – The first computerized gas station has been opened in Australia at Christie's Beach, 20 miles south of Adelaide.

A spokesman for the operators, Independent Oil Compnay (IOC), said the new system, which checks the flow of gas into a car tank and records the price in the station's central office, should cut service station stops by about 1-1/2 minutes.

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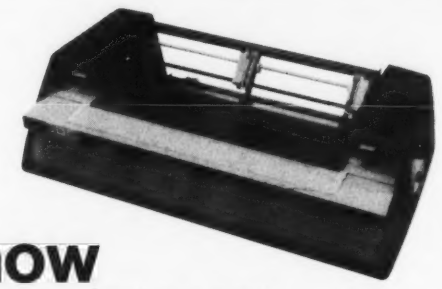

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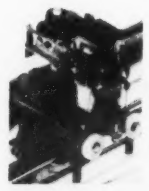

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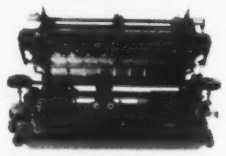
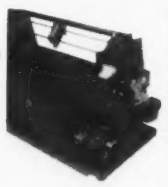
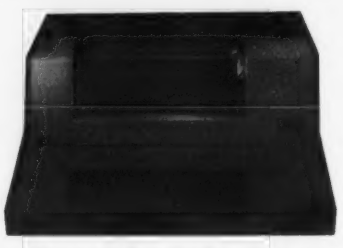


"naked" printer complete



paper carriage and printer

keyboard



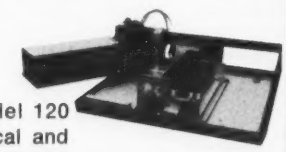
oem model 120

OEM Model 120 is an asynchronous serial impact printer which may serve as a communications terminal, a billing printer for accounting systems, a computer output printer, or a data entry device.

OEM Model 120 is available in a variety of forms, ranging from the basic print mechanism alone, with a parallel interface operating at 120 cps, to a complete KSR with serial interface and operator-selectable speeds of 10, 15, 30, 60 and 120 cps.

OEM Model 120 is compatible with nearly all low and medium speed teletypewriters and an unlimited variety of other peripheral devices.

The basic coding is ASCII. It is also available as an EBCDIC printer, and an option provides both codes in a single printer. The entire 128-character ASCII code is generated by the OEM Model 120 keyboard; all 96 ASCII graphics are printed.



The complete OEM Model 120 printer contains mechanical and electromechanical components, interface, control logic, character generators, motor drive circuitry, and a tractor feed paper transport.

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Cost-Effective Soviet DP Use Expected

By Marvin Smalheiser
CW West Coast Bureau

LOS ANGELES – The Russians' greatest strength in using computers is likely to be in cost effectiveness and in software development, according to Erwin Tomash, chairman of Data Products Corp.

Tomash's firm drew a standing-room-only audience recently in Moscow when it exhibited equipment and conducted a three-day symposium on printers, core and card equipment.

Hard Workers

The best that will come from the Russian approach to computers, Tomash said, is that they will use their machines very effectively. "They'll work their machines harder."

"We have a long lead in technology," he said, and added that the Russians are "not likely to show us much in terms of technology" even though they have a large commitment of brainpower.

Their technology lag, he said, is attributable to a "very long feedback loop compared with ours" plus lack of experience in translating ideas into mass production.

But the desire and the need for computer technology, Tomash said, is very real and he cited what he said was an even greater need in Russia than the U.S. for data handling and automation.

Data Products' symposium filled a hall with a capacity for 150 persons three days and attracted designers and engineers from as far as Kiev, Leningrad and Novosibirsk.

Soviet engineers examine a Data Products printer.

Tomash described the audiences as extremely eager for design details regarding core memory and printing equipment and very well trained in their fields.

"There is no question the Russians are interested in building up their own computer industry, particularly in peripherals where they lag," he said.

"They are interested in buying, but they want to buy with some kind of licensing with rights to manufacture so they can become more self-sufficient. Over the next decade they expect to be self-sufficient."

The Data Products symposium and exhibit are part of an international effort that has been producing about 20% of the firm's revenues.

Looking at the company's earnings picture, he said, "We expect to have a good year.

"This is the first year we're returning to normal profit levels and it will permit us to reinvest as we should in engineering and new product development and corporate growth."

Women engineers view printer mechanism.

He said two new printers are being put into production. One is a lower-cost 300 line/min machine and the other is a "deluxe machine."

Plans call for Data Products to enter the low-cost message market, which he said offers a great area of growth.

The company will continue to pursue its OEM orientation unless it develops a market the way it has with its embossed card equipment.

Semiconductor Threat

Regarding the threat of semiconductors to Data Products' core memory commitment, Tomash said a task force is analyzing the situation and will recommend how the company should move.

In the meantime, he said, core is still growing – a 30% increase in shipments this year – and is likely to prevail in certain markets.

"I've been in the core business since 1956," he said. "I thought then core would decline in five years and again in the 1960s. It still looks that way, but this time I think it is true."

Tomash doesn't expect the economy to suffer a recession although there "certainly is going to be a leveling off."

Bank, Martin Marietta Form Joint DP Company

HARTFORD, Conn. – Martin Marietta Corp. and Hartford National Bank and Trust Co. have formed a joint venture company, Financial Industry Systems, to offer DP resource management and related services to banks and other financial institutions.

Staffed by the Data Systems Divisions of the parent firms, the new company's services range from design and installation of systems to facilities management.

Contracts

Univac has been awarded four Navy contracts totaling $23.5 million including orders for 30 AN/UYK-7s, CP642Bs and a 1110.

Vogue Instrument Corp. has received a contract from Raytheon Data Systems Co. for airline ticket printers and boarding pass printers to operate in conjunction with Raytheon's PTS 100 display terminal system.

General Systems Co. has been awarded a contract by Collins Radio Co. for development of a systems engineering program for product quality control.

Computer Entry Systems Corp. has been awarded a contract by General Instrument Corp. for 50 optical character readers to be used in General Instrument's Documate 75 accounts receivable processing system.

Control Data Corp. has signed an agreement with the Wisconsin Electric Power Company System to supply a computer-based energy control system for a power generation and transmission control center scheduled for 1975.

Electronic Associates, Inc. has been awarded a $1.4 million contract by the U.S. Naval Weapons Center, China Lake, Calif., for analog and digital computer systems to be used in the development of Agile, an air-to-air defensive missile.

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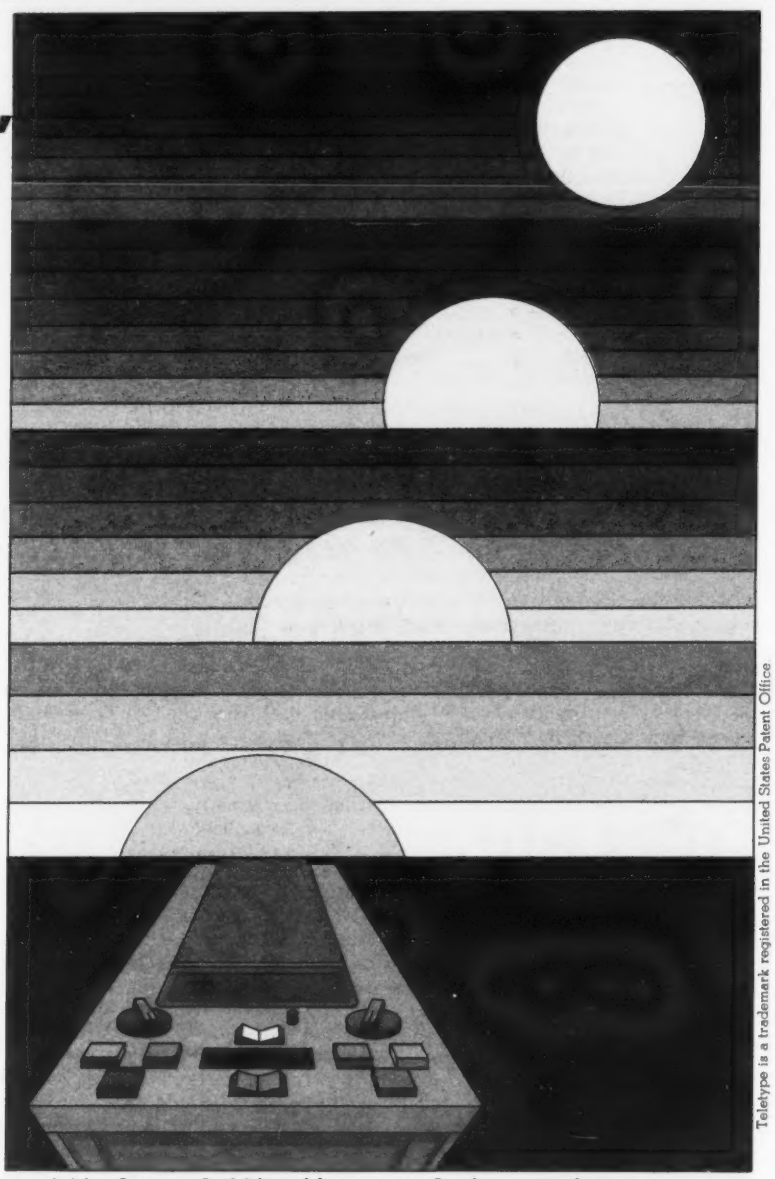

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Creditors Grant CCI a Moratorium

CW West Coast Bureau

LOS ANGELES – Computer Communications, Inc. (CCI) has been granted a 30-day moratorium by its creditors as a result of a creditors meeting to review the company's financial status.

A creditors committee was appointed and the company said it is continuing negotiations to get necessary working capital following the withdrawal of a public offering for $3 million announced June 12 that did not get off the ground.

The company estimates a loss for the year ended June 30, before audit and year-end adjustments, of about $2 million on revenues of $4 million.

Last year CCI lost $1.8 million on restated sales of nearly $6 million.

Directors Louis Garfin, Hugh F. Colvin and Timothy Collins have resigned, the firm said.

Raymond E. High, vice-president of administration and contracts, was named a director.

Dr. Robert E. Fagen, who resigned previously, has terminated his relationship with the company.

RCA Sale Worth $137 Million

NEW YORK – RCA Corp. will realize $137 million from the sale of its computer base to Univac, an increase over the originally projected revenue of from $100 million to $130 million.

Under the amended agreement between the two firms, fixed cash payments from Sperry Rand will replace shared revenue contingency payments over five years.

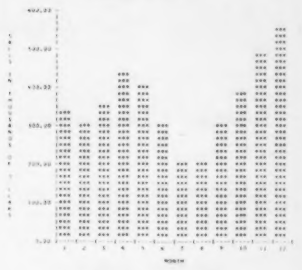
Sperry Rand will pay RCA $36.7 million in three cash installments over the next two years.

The two companies cited the complexities of revenue sharing and said they found a cash settlement to be mutually advantageous.

RCA indicated it has also received revenue of $10 million from the sale to Sperry Rand of spare parts and services.

The payments received by RCA are accounted for in the special reserve set up in 1971 to cover discontinuance of RCA's computer operations and have no effect on current profits, the firm said.

ESPLOT



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UCC Names Grayson, Saxon to Board

DALLAS – C. Jackson Grayson, former chairman of the U.S. Price Commission, and James J. Saxon, former U.S. controller of the currency, have been named to the board of directors of University Computing Co., the service subsidiary of Wyly Corp.

Grayson served as chairman of the Price Commission during Phase II of President Nixon's Economic Stabilization Program and is dean of the School of Business Administration of Southern Methodist University.

Other Moves

■ Arthur Mackey, president of MDS-Canada, has been elected to the board of directors of Mohawk Data Sciences Corp. Mackey has also been named chairman of the company's operating committee.

■ A.M. Cosentino, who has been serving as interim chief executive and chief operating officer for Basic/Four, has been named president of that corporation.

■ Timothy J. O'Connor has been promoted to the new position of vice-president, financial plans and controls, for Control Data Corp.

Executive Corner

■ Henry Lewis has been appointed manager of European operations for Interdata, Inc.

■ Donald S. Cole has been named executive vice-president of Dearborn Computer Leasing Corp.

■ Charles E. Macon has been appointed general manager of Burroughs' Systems Products Group. He was formerly director of engineering for the company's International Group.

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But we're not simply taking our American ideas and customs abroad. We know that the needs of EDP users differ from country to country, and we've arranged for local sponsorship and guidance for each European Caravan.

In Germany, a leading EDP marketing organization, AMS Market Services, will be in charge of Exhibit Management and Sales. Dr. Gerhard Maurer, a widely respected EDP expert, will manage our Forums; and promotional support will be provided through leading EDP trade publications.

Germany is Europe's largest EDP market, and the German Computer Caravan is a unique, new way for your company to increase its sales there. To get a free brochure, just send in the coupon below. We'll send out the details right away.

The German Computer Caravan Schedule

Dusseldorf	Nov. 1-Nov. 3
Hamburg	Nov. 6-Nov. 8
Frankfurt	Nov. 13-Nov. 15
Berlin	Nov. 20-Nov. 22
Munich	Nov. 27-Nov. 30

TO: Neal Wilder
Vice President, Marketing
Computerworld
797 Washington Street
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Please send me further details on the European Computer Caravans.

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DPF Extends Service Concept, Cuts Debt

By Molly Upton
Of the CW Staff

HARTSDALE, N.Y. – Armed with a vastly improved balance sheet, lessor DPF, Inc. is making strides to offer more extensive services to its lessees and is now in a position to "make moves both internally and externally," according to President Bertram J. Cohn.

"We have broadened the concept of a lessor," he noted, "so that from our point of view we maximize the revenue stream and the customer minimizes expenses."

DPF offers enhancements to 360s in the way of add-on memory, high-speed disk and adapters, front-end telecommunications equipment and software enhancements.

It also has its own systems engineering group, which works with the marketing and product enhancement units to help the user evaluate alternatives.

In addition, DPF no longer views its role as just a financial service, but endorses the full service concept, whereby district managers call on users to assist them in getting the maximum use out of their equipment, noted Michael J. Creedon, marketing vice-president.

"I think we have to offer the customer more services in order to keep him fully satisfied with the 360 environment," Cohn said.

User 'More Sophisticated'

"We're finding that the DP manager is becoming more sophisticated and more cost conscious and therefore more willing to investigate the alternatives to simply going along with what the IBM salesman recommends," he commented.

"It's becoming more a matter of analysis of throughput versus expense than it is merely having the latest piece of equipment and not knowing exactly what it's going to do for you," he observed.

In addition to its 360 efforts and a plan to spend about $18 million in product enhancements over the next several years, the firm has established a 370 leasing operation, both operating and full payout, an in-house leverage lease underwriting capability, and DPF Commercial, which leases non-computer equipment.

The firm accounts for its 360 operations on a break-even principle, that is, reporting neither profit nor loss if the operation performs as expected.

Cohn said that although DPF doesn't want to be entirely in 360s, it would "be very happy and willing and anxious" to acquire another 360 portfolio, if it meets DPF's specifications.

The firm currently has about $73.9 million in 360s as of May 31, Cohn said, and a little over $6 million in 370s with future commitments for about $6.5 million.

"We feel that if a firm has a full service support program and the proper type of product enhancement program and a well organized marketing effort, it can extend the revenue producing life of this equipment for quite some period of time," Cohn noted.

Reaffirming DPF's faith in 360s are the figures released by the firm that indicate as of May 31 all CPUs were on rent or committed, and a reduction in its gross off-rent position from 5% of the total portfolio in 1972 to 3% in 1973.

During the year, DPF managed to reduce its debt by about $29.6 million. The new management team, which went in about 20 months ago, also reduced the selling, general and administrative expenses by about $1.4 million, Cohn said.

At the end of May 1973, DPF owed $11.4 million in secured debt whereas in 1972 the figure was $28.3 million.

The firm also cut its unsecured debt by $11 million, and its convertible debt by nearly $1 million.

At the end of 1972 DPF had $79.9 million total liabilities, and a year later, it had $50.2 million.

Litigation Settled

DPF and a group of dissident shareholders have settled the litigation filed by the firm against the group.

DPF had filed a complaint against three individuals and two investment firms alleging violations of the Securities Exchange Act of 1934 governing the solicitation of proxies and the acquisition of corporate control.

According to the settlement terms, the defendants agreed to drop solicitation of proxies to elect directors at the next annual meeting. They further agreed to refrain from any further proxy solicitation for directors before Oct. 31, 1975, and to refrain from participating in any plan to seek control of DPF through a tender offer or other means through Oct. 31, 1975.

DPF agreed to reimburse the dissidents for partial legal and other expenses.

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Who can sell computers in Japan?

Shukan.

In Japanese it's called *Shukan Computer*, and in English, it means "Computer Weekly." Whatever you call it, *Computerworld*'s new sister publication is an excellent vehicle for selling EDP products and services in the large and expanding Japanese EDP market. Here are some of the reasons why:

• **Shukan Computer** is a joint venture of *Computerworld* and Dempa Publications, the leading Japanese publisher of electronics information services. With the combined resources of the two companies, Shukan has the largest news gathering organization of its kind in the world.

• **Shukan Computer** is the only newsweekly for the fast-growing Japanese computer community.

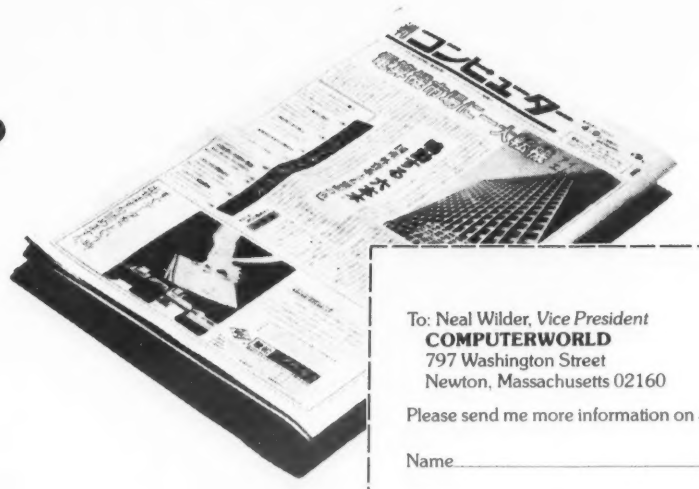
• Initial circulation is guaranteed at 35,000, divided about 80% to end-users and 20% to the computer industry. Circulation development methods currently under way are the same as those which gave *Computerworld* the highest paid circulation in its field in less than four years.

• **Shukan** lets you in on the action in the world's fastest growing EDP market. The Japanese Ministry of International Trade and Industry (MITI) has made the following 1976 forecast: 39,000 general-purpose systems installed, up from 11,237 in 1971; 11,000 minicomputers installed, up from 1,670 in 1971; and 3,000 industrial systems installed, up from 1,086 in 1971.

• Is this growth likely? The latest census of general-purpose systems revealed that there were 14,806 systems installed as of September 1972, a one-year gain of 3,569 units and $911 million installed value, a growth of 31.7% and 23.1% respectively. And more than 50% of these new systems were American made.

• It is true that there are import restrictions. But Japanese vendors and users can get permission to import almost anything they want and need. As a result, 1972 imports were over $360 million.

• Advertising in Shukan is easy. With *Computerworld* representatives across the U.S. to assist you, it's easy to place space in Shukan. For a small fee, we can translate and type-set your ad from English to Japanese. To get more facts, just send in the coupon.



To: Neal Wilder, *Vice President*
COMPUTERWORLD
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Position Announcements

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We seek an individual with experience in managing multiple small systems and programming projects, budgeting staff and directing people. In addition, must be capable of offering technical direction to our staff based upon his comprehensive knowledge of IBM COBOL, ALC, OS & DOS, and capable of project participation when required. Intermittant travel is required, and needless to say, the hours can be long and the pace is always rapid.

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Northern Regional Manager: Robert Ziegel. **Account Manager:** Mike Burman. Computerworld, 797 Washington St., Newton, Mass. 02160. Tel: (617) 332-5606.

Eastern Regional Manager: Donald E. Fagan. **Account Manager:** Frank Gallo. Computerworld, Suite 1511, 225 W. 34th St., New York, N.Y. 10001. Tel: (212) 594-5644.

Los Angeles Area: Bob Byrne. Robert Byrne & Assoc., 1541 Westwood Blvd., Los Angeles, Calif. 90024. Tel: (213) 477-4208.

San Francisco Area: Bill Healey. Thompson/Healey Assoc., 1111 Hearst Bldg., San Francisco, Calif. 94103. Tel: (415) 362-8547.

Japan: Ken Suzuki. General Manager, Dempa/Computerworld, 1-11-15 Higashi Gotanda, Shinagawa-ku, Tokyo 141.

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Duties will include: 1) technical systems support – sysgens, implementing software items such as CICS, DOS/VS, compilers, and forecasting-analysis programs, operating system modifications and tuning; 2) user information and assistance – aid in documenting operating procedures, conducting in-house education, assistance and consulting in programming information and design.

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Individual will be responsible for software projects, products and practices both within Digital and in customer facilities and must be able to isolate and identify faults that are neither indisputably software or hardware. Applicant should have experience on PDP 10 monitor and EDP applications written in COBOL. Masters in Computer Science desirable.

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The above position is open for application to men and women regardless of race, national origin, age, religion or creed.

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Experienced professional desired to SYSGEN and modify new OS/MFT and HASP releases without assistance. BTAM and Assembler Language skills are required.

Beginning salary $13,950. 4-Day Week.

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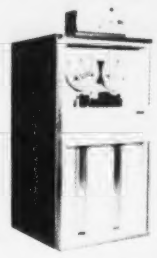

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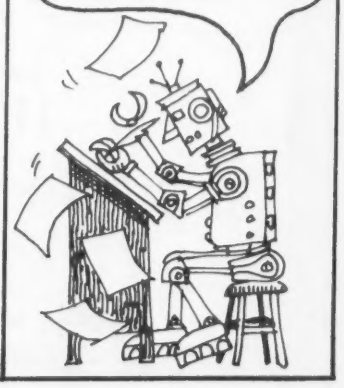

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STC Earnings, Revenues Rise in Half

LOUISVILLE, Colo. – Storage Technology Corp. turned in a sharp increase in earnings and revenues for the six months and quarter ended June 29.

The number of new units going on lease with end users reached record levels during the second quarter and was about 10% greater than the number in the first quarter, STC said.

As of July 27, annual revenues from service and rental income had risen to about $18.3 million from $7.9 million a year earlier, the company said.

The quarter and half both show expenses for the firm's affiliate Disk Systems Corp. In the half, the charges totaled $544,000 or 16 cents a share, of which $364,000 or 11 cents a share occurred in the second quarter.

In the quarter, earnings totaled $1.4 million or 42 cents a share, including $520,000 tax credit, compared with $725,000 or 22 cents a share in the year-ago period, when there was a $342,000 tax credit.

Revenues more than doubled to $11.7 million from $5.8 million in the 1972 period.

In the half, earnings reached $3.1 million or 91 cents a share, including a $1.2 million tax credit. This compares with $932,000 or 30 cents a share, which includes a $441,000 tax loss in the same year-ago period.

Six-month revenues rose to $23 million from $9.6 million a year ago. About $14.1 million worth of equipment was sold in the first half pursuant to existing third-party sales agreements, STC said.

Interim profits continue to be "heavily dependent" on the amount and type of outright sales and this will continue for at least the near term, according to a company spokesman.

The company said it is negotiating a new sales agreement with B.A. Leasing Corp., a subsidiary of Bank of America, and has reached an agreement in principle with its banks to increase to $40 million its present $34 million credit agreement.

Wyly Loses $1.4 Million in Quarter, Shows Improvement in Six Months

DALLAS – Wyly Corp., formerly University Computing Corp., reported a loss in the second quarter ended June 30, but had earnings of $771,000 for the six months.

Earnings from computer services in the half were "substantially improved" on moderately higher revenues, according to President Sam Wyly. Pretax income reached $674,000 from $122,000 in the year-ago quarter.

The quarter showed a loss of $1.4 million or 17 cents a share compared with earnings of $841,000 or 10 cents a share in the 1972 period.

Revenues were $50 million compared with $48.7 million a year ago.

The loss included an insurance underwriting loss of $874,000; a currency revaluation loss of $580,000, and deletion of 1972 tax credit of $874,000 that had added 11 cents a share in after-tax earnings to first quarter results.

Other factors contributing to the weaker report was a drop in insurance pretax income to $1 million from $3.2 million, and a change in the accounting policy regarding leasing, whereby income is applied against equipment depreciation.

In the six months, the story was different, with earnings of $771,000 or 9 cents a share compared with a loss of $3.5 million or 42 cents a share in the 1972 period.

The year-ago loss resulted primarily from a $16.1 million provision for anticipated loss on the subsequent sale of the company's manufacturing subsidiary (CSI), Wyly said.

Comparison of the six-month period in both years, omitting the loss provision of 1972, shows "steady progress in nearly all operational areas," according to Wyly.

In addition to improved earnings from DP services, he cited continuing reduction in parent company interest and overhead expenses; steadily improving investment income in the insurance subsidiary; and profitable operational results despite elimination of earnings from the leasing business.

Wyly Corp.'s investment in its Datran subsidiary has increased to $24.3 million as of June 30 from $18.2 million at the end of 1972, he said.

Pitney Bowes Increases Equity in Joint Firm

STAMFORD, Conn. – Pitney Bowes Inc. has increased its equity in jointly-owned Pitney Bowes-Alpex to 64% from 50%, and its president, Fred T. Allen, will become chairman of the board of the unit.

Under the terms of an agreement with Alpex, Pitney Bowes received additional shares of Pitney Bowes-Alpex in proportion to its investment in the company.

Since the unit's formation, when Pitney Bowes put in $9.5 million in cash and Alpex Computer contributed substantially all its assets, Pitney Bowes has contributed an additional $12 million, and Alpex $6 million, Pitney Bowes said.

Data 100 Posts Rising Earnings

MINNEAPOLIS, Minn. – Data 100 Corp., aided by sales to Randolph Computer Corp. and higher sales to end users, as well as leasing income, saw its earnings and revenues climb for the third consecutive quarter.

With records in the second quarter and six months, the remote batch terminal maker's shipments rose in the second quarter to an "if sold" value of $12.8 million, up 77% from a year ago. In the six months, shipments climbed 85%, reaching nearly $24 million.

Sales to Randolph Computer Corp. accounted for quarterly revenues of almost $4 million and nearly $7 million in the half year.

Second quarter earnings, including a $347,000 tax credit, totaled $722,000 or 25 cents a share compared with a loss of $1.9 million or $1.46 a share in the same 1972 quarter.

Revenues rose to $9.4 million from $2.2 million a year ago.

In the six months, earnings reached $1.2 million, or 42 cents a share, including a $579,000 tax credit, compared with a loss of $3.9 million or $3.08 a share in the year-ago period.

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Earnings Reports

VARIAN ASSOCIATES
Three Months Ended June 30

	1973	1972
Shr Ernd	$.26	$.16
Revenue	62,822,000	52,537,000
Earnings	1,790,000	1,180,000
9 Mo Shr	.69	.29
Revenue	178,394,000	150,408,000
Spec Cred	.....	258,000
Earnings	4,863,000	2,105,000

BEEHIVE MEDICAL ELECTRONICS
Nine Months Ended June 30

	1973	1972
Shr Ernd	$.34	$.04
Revenue	2,350,316	1,276,344
Earnings	319,328	41,508

COMPUTER SCIENCES
Three Months Ended June 29

	1973	1972
Shr Ernd	$.01	.....
Revenue	33,814,000	a$26,179,000
Earnings	181,000	(1,208,000)

a-Restated to exclude sales of subsidiaries sold in February 1973.

DATA DOCUMENTS
Three Months Ended June 30

	1973	1972
Shr Ernd	$.80	$.51
Revenue	10,086,223	7,487,648
Tax Cred	19,074	21,247
Earnings	376,288	240,157
9 Mo Shr	2.02	1.48
Revenue	27,192,539	21,052,076
Tax Cred	54,438	58,927
Earnings	947,091	694,032

INTERDATA
Three Months Ended June 30

	1973	1972
Shr Ernd	$.14	$.13
Revenue	4,196,700	3,118,100
Spec Cred	.....	121,800
Earnings	278,100	253,100
6 Mo Shr	.27	.25
Revenue	8,026,300	5,959,600
Spec Cred	5,100	268,700
Earnings	550,600	463,800

APPLIED MAGNETICS
aThree Months Ended June 30

	1973	1972
Shr Ernd	$.19	$.03
Revenue	13,979,000	10,015,000
Spec Cred	b219,000	.....
Earnings	792,000	110,000
9 Mo Shr	.43	.19
Revenue	35,851,000	21,915,000
Spec Cred	b219,000	.....
Earnings	1,820,000	786,000

a-Includes from date of purchase, operations of Trendata Corp., purchased in March 1973, and Geo Space Corp., purchased in April 1972. b-Gain from sale of assets.

ITEL
Three Months Ended June 30

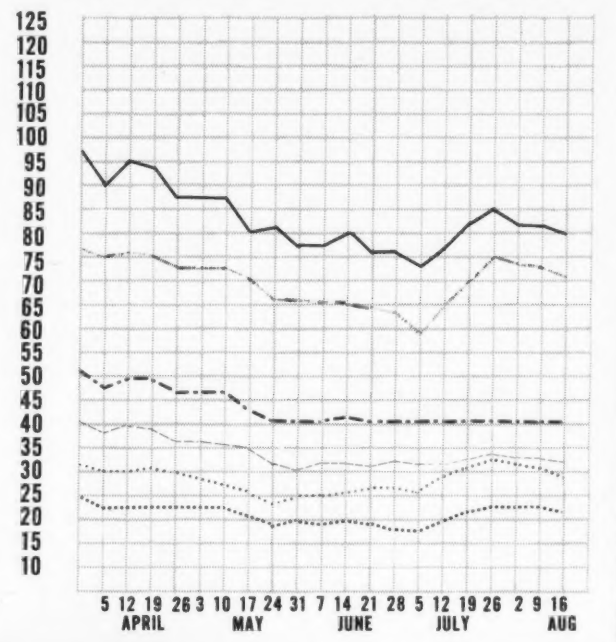
	1973	1972
Shr Ernd	$.23	.....
Revenue	44,074,000	$20,141,000
Tax Cred	340,000	.....
Earnings	1,773,000	(1,273,000)
6 Mo Shr	.33	.....
Revenue	77,399,000	39,585,000
Tax Cred	594,000	.....
Earnings	2,494,000	(2,800,000)

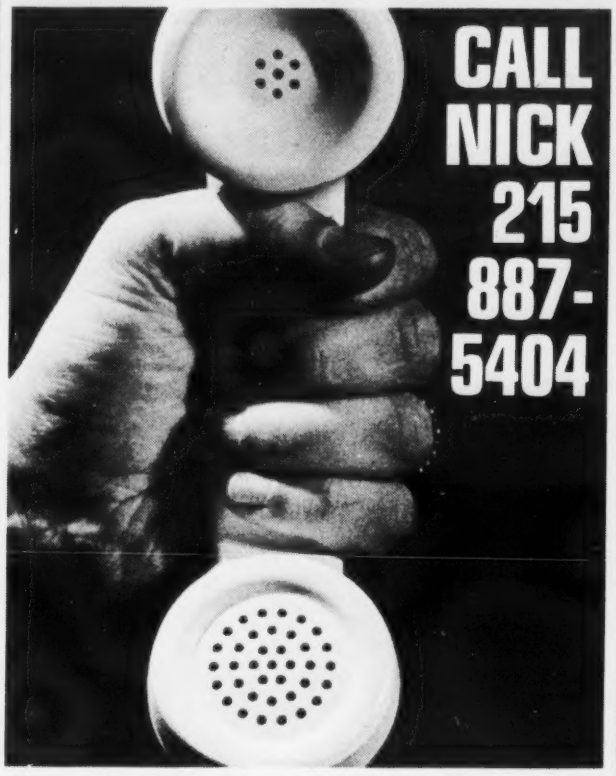
NCR
Three Months Ended June 30

	1973	a1972
Shr Ernd	$.58	$.17
Revenue	433,416,000	384,498,000
Earnings	b13,357,000	3,864,000
6 Mo Shr	.90	.....
Revenue	800,808,000	711,291,000
Earnings	b20,814,000	(2,150,000)

a-Adversely affected by a strike at domestic plant and below normal shipments in UK following decimalization. The 1972 results were restated to reflect accounting changes. b-After gain from sale of micropublishing operation in the quarter and gain from foreign exchange rates following devaluation of the dollar.

COMPUTERWORLD Computer Stocks Trading Indexes





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1	1051 N1	Control Unit	Immediate
1	1052 8	Printer-Keyboard	Immediate
5	2311 1	Disc Storage Dr.	Immediate
2	2841 1	Storage Control	Immediate
1	1403 N1	Printer	Immediate

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TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

F		PRICE 1973 RANGE (1)	CLOSE AUG 16	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	211-245	224 3/4	-2 1/4	-0.9
N	COLLINS RADIO	16- 24	SUSPENDED		
O	COMPUTER AUTOMATION	5- 16	10 7/8	-1 1/8	-9.3
N	CONTROL DATA CORP	31- 62	33 5/8	-3 5/8	-9.7
O	DATA GENERAL CORP	28- 46	38 1/2	-2	-4.9
O	DATAPOINT CORP	10- 21	10	-1	-9.0
O	DIGITAL COMP CONTROL	2- 6	3 1/4	+ 1/4	+8.3
N	DIGITAL EQUIPMENT	73-105	89 3/8	-2 3/8	-2.5
N	ELECTRONIC ASSOC.	4- 9	4 5/8	- 1/8	-2.6
A	ELECTRONIC ENGINEER.	6- 11	9 5/8	- 5/8	-6.0
N	FOXBORO	23- 36	36 3/8	+1 1/8	+3.1
O	GENERAL AUTOMATION	22- 55	33 1/4	-3 3/4	-10.1
O	GRI COMPUTER CORP	1- 3	1 1/4	+ 1/4	+25.0
N	HEWLETT-PACKARD CO	74- 95	80 3/4	-3 3/8	-4.0
N	HONEYWELL INC	99-139	104 1/8	-1 5/8	-1.5
N	IBM	299-340	300 1/2	-3	-0.9
O	INTERDATA INC	7- 13	8	- 3/4	-8.5
N	MEMOREX	2- 19	4 7/8	0	0.0
O	MICRODATA CORP	2- 10	3	- 1/4	-7.6
N	NCR	27- 38	34 1/4	-1 7/8	-5.1
N	RAYTHEON CO	22- 34	24 3/8	- 5/8	-2.5
N	SINGER CO	45- 74	50 7/8	-5 5/8	-9.9
N	SPERRY RAND	36- 50	45 1/2	- 3/4	-1.6
A	SYSTEMS ENG. LABS	3- 8	3 1/2	0	0.0
N	TEXAS INSTRUMENTS	83-110	101 1/8	-3 7/8	-3.6
O	ULTIMACC SYSTEMS INC	1- 11	3	- 1/4	-7.6
N	VARIAN ASSOCIATES	10- 20	12 1/2	- 1/2	-3.8
N	WANG LABS.	13- 34	21 1/4	-1 7/8	-8.1
N	XEROX CORP	141-169	150 1/4	-5 1/4	-3.3
	LEASING COMPANIES				
A	BOOTHE COMPUTER	1- 5	1 1/4	- 1/4	-16.6
O	BRESNAHAN COMP.	1- 2	2	+ 3/4	+60.0
O	COMDISCO INC	6- 17	6 3/4	- 1/4	-3.5
O	COMMERCE GROUP CORP	3- 4	3 1/2	- 3/8	-9.6
O	COMPUTER EXCHANGE	1- 1	1/2	+ 1/4	+100.0
A	COMPUTER INVSTRS GRP	2- 8	2 3/4	- 1/4	-8.3
O	COMP. INSTALLATIONS	1- 2	1	0	0.0
M	DATRONIC RENTAL	2- 3	2	0	0.0
A	DCL INC	1- 3	1 1/8	+ 1/8	+12.5
A	DEARBORN-STORM	12- 26	17 1/4	-2 3/8	-12.1
N	DPF INC	5- 9	5 1/4	0	0.0
O	EDP RESOURCES	1- 3	1 5/8	- 1/8	-7.1
A	GRANITE MGT	2- 6	3 1/4	- 1/4	-7.1
A	GREYHOUND COMPUTER	3- 6	3 7/8	- 1/8	-3.1
A	ITEL	4- 12	5	0	0.0
N	LEASCO CORP	8- 18	10 3/4	- 1/8	-1.1
O	LEASPAC CORP	2- 8	2 1/2	- 1/4	-9.0
O	LECTRO MGT INC	1- 2	1 1/4	0	0.0
O	NRG INC	5- 15	4 5/8	- 1/2	-9.7
A	PIONEER TEX CORP	5- 8	4 5/8	- 1/4	-5.1
A	ROCKWOOD COMPUTER	1- 3	1 1/4	0	0.0
N	U.S. LEASING	18- 36	21 3/8	-1 1/4	-5.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

E		PRICE 1973 RANGE (1)	CLOSE AUG 16	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER COMMUN.	1- 4	5/8	- 1/4	-28.5
A	COMPUTER EQUIPMENT	2- 3	1 7/8	- 1/4	-11.7
O	COMPUTER MACHINERY	5- 13	6 1/8	- 1/2	-7.5
O	COMPUTER TRANSCEIVER	1- 6	1 7/8	+ 1/8	+7.1
N	CONRAC CORP	15- 32	17	- 1/2	-2.8
O	DATA ACCESS SYSTEMS	1- 3	1	- 3/4	-42.8
O	DATA 100	9- 18	11 7/8	-1 1/8	-8.6
A	DATA PRODUCTS CORP	2- 4	3 7/8	+ 1/8	+3.3
O	DATA RECOGNITION	2- 3	1 1/2	0	0.0
O	DATA TECHNOLOGY	2- 5	2 5/8	+ 1/4	+10.5
O	DECISION DATA COMPUT	8- 40	14 1/8	+ 5/8	+4.6
O	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
O	DIZAN CONTROLS	1- 4	1 5/8	+ 1/4	+18.1
N	ELECTRONIC M & M	3- 6	3 3/4	- 1/8	-3.2
O	FABRI-TEK	2- 5	2 7/8	- 1/8	-4.1
O	GENERAL COMPUTER SYS	5- 9	4 3/4	- 3/4	-13.6
N	GENERAL ELECTRIC	56- 76	60 1/4	+ 5/8	+1.0
N	HAZELTINE CORP	5- 9	5 1/4	- 1/8	-2.3
O	INFOREX INC	5- 23	7 1/2	- 3/4	-9.0
O	INFORMATION DISPLAYS	1- 2	1/2	0	0.0
O	INFORMATION INTL INC	10- 15	10 3/4	- 1/2	-4.4
A	LUNDY ELECTRONICS	3- 9	4 3/8	- 3/8	-7.8
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
A	MILGO ELECTRONICS	14- 28	17 1/8	-1 7/8	-9.8
N	MOHAWK DATA SCI	4- 13	5 1/8	- 1/8	-2.3
O	ODEC COMPUTER SYST.	2- 6	2	0	0.0
O	OPTICAL SCANNING	2- 7	4 1/4	0	0.0
O	PERTEC CORP	5- 8	5 1/4	- 1/2	-8.6
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	3- 9	4	- 1/2	-11.1
O	PRECISION INST.	2- 6	5	+2 1/2	+100.0
O	QUANTOR CORP	5- 10	5 1/2	- 1/2	-8.3
O	RECOGNITION EQUIP	4- 8	5	- 7/8	-14.8
N	SANDERS ASSOCIATES	7- 18	8 7/8	- 5/8	-6.5
O	SCAN DATA	1- 6	2	- 1/4	-11.1
O	STORAGE TECHNOLOGY	11- 34	12	-1 3/8	-10.2
O	SYCOR INC	9- 14	13 3/4	+1 3/4	+14.5
O	TALLY CORP.	2- 14	3 7/8	- 1/2	-11.4
O	TEC INC	5- 9	7	- 1/4	-3.4
N	TEKTRONIX INC	30- 53	40	- 1/2	-1.2
N	TELEX	3- 6	3 1/4	- 3/8	-10.3
O	WANGCO INC	7- 13	8 3/4	- 3/4	-7.8
O	WILTEK INC	9- 18	10 3/4	- 1/2	-4.4
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	5- 9	4 3/4	- 5/8	-11.6
A	HARRY WRIGHT	6- 13	7 1/8	- 3/8	-5.0
A	DATA DOCUMENTS	17- 22	20 1/4	-1 1/4	-5.8
O	DUPLEX PRODUCTS INC	7- 10	8 1/8	- 1/4	-2.9
N	ENNIS BUS. FORMS	5- 8	5 5/8	- 3/8	-6.2
O	GRAHAM MAGNETICS	9- 20	9 1/2	-1 3/4	-15.5
O	GRAPHIC CONTROLS	8- 12	10 1/2	+ 3/4	+7.6
N	3M COMPANY	78- 89	83 1/2	-3	-3.4
O	MOORE CORP LTD	53- 60	55	-1 1/4	-2.2
N	NASHUA CORP	42- 58	49 3/4	- 1/8	-0.2
O	REYNOLDS & REYNOLD	40- 51	42 1/4	- 1/4	-0.5
O	STANDARD REGISTER	14- 20	15	0	0.0
O	TAB PRODUCTS CO	10- 23	8	-1 1/2	-15.7
N	UARCO	15- 23	16	-1	-5.8
A	WAHASH MAGNETICS	5- 7	6 3/8	- 3/8	-5.5
N	WALLACE BUS FORMS	15- 26	18 1/4	+ 1/8	+0.6

E		PRICE 1973 RANGE (1)	CLOSE AUG 16	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 1/2	- 1/8	-7.6
A	APPLIED DATA RES.	2- 4	2	- 1/8	-5.8
O	APPLIED LOGIC	1- 3	1/2	0	0.0
N	AUTOMATIC DATA PROC	39- 94	55 1/2	- 5/8	-1.1
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	6- 9	6 1/4	0	0.0
O	COMPUTER DIMENSIONS	2- 5	2 1/4	0	0.0
O	COMPUTER DYNAMICS	1- 2	3/8	0	0.0
O	COMPUTER HORIZONS	1- 6	2 1/2	0	0.0
O	COMPUTER NETWORK	1- 6	1	0	0.0
N	COMPUTER SCIENCES	2- 6	3 1/8	- 3/8	-10.7
O	COMPUTER TASK GROUP	1- 2	1 1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 3	1	0	0.0
O	COMPUTER USAGE	4- 9	5 3/8	0	0.0
O	COMRESS	1- 2	3/8	+ 1/8	+50.0
O	COMSHARE	4- 9	4 1/2	+ 1/4	+5.8
N	CONDUNA CORP	5- 15	4 3/4	- 3/4	-13.6
O	CYBERNATICS INC	1- 3	1 1/2	- 1/8	-7.6
O	DATATAB	2- 4	1 3/8	- 3/8	-21.4
A	ELECT COMP PROG	1- 2	1 1/8	- 1/8	-10.0
N	ELECTRONIC DATA SYS.	29- 56	35	-2 7/8	-7.5
O	INFONATIONAL INC	1- 2	3/8	0	0.0
O	INFORMATICS	2- 6	4 1/8	- 1/8	-2.9
O	I.O.A. DATA CORP	1- 1	5/8	0	0.0
O	IPS COMPUTER MARKET.	1- 5	1	- 1/4	-20.0
O	KEANE ASSOCIATES	3- 4	3 3/4	0	0.0
O	KEYDATA CORP	6- 12	6 1/8	+ 1/8	+2.0
O	LOGICON	3- 7	3 1/2	- 5/8	-15.1
A	MANAGEMENT DATA	2- 5	1 7/8	- 1/4	-11.7
O	NATIONAL CSS INC	18- 42	21	-1 1/2	-6.6
O	NATIONAL COMPUTER CO	1- 1	3/8	0	0.0
O	NATIONAL INFO SRVCS	1- 2	5/8	0	0.0
P	ON LINE SYSTEMS INC	12- 17	16 3/8	+ 3/4	+4.7
N	PLANNING RESEARCH	2- 7	3 3/8	- 1/8	-3.5
O	PROGRAMMING METHODS	21- 25	22	-1 3/4	-7.3
O	PROGRAMMING & SYS	1- 1	7/8	0	0.0
O	RAPIDATA INC	5- 24	6 1/2	- 1/8	-1.8
O	SCIENTIFIC COMPUTERS	1- 3	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 4	1 1/2	- 1/8	-7.6
O	TRS COMPUTER CENTERS	2- 4	1 3/4	0	0.0
O	TCC INC	1- 1	3/8	- 1/8	-25.0
O	TYMSHARE INC	6- 12	8 5/8	- 3/8	-4.1
O	UNITED DATA CENTER	4- 6	3 3/4	0	0.0
A	UMS SYSTEMS	4- 8	4 1/8	+ 1/4	+6.4
N	WYLY CORP	4- 11	5 1/4	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	12- 34	13	- 3/8	-2.8
O	ADVANCED MEMORY SYS	5- 23	6	- 1/4	-4.0
N	AMPEX CORP	4- 7	4 7/8	+ 1/4	+5.4
O	ANDERSON JACOBSON	3- 8	3 1/2	-1	-22.2
O	APEHIVE MEDICAL ELEC	6- 10	5 3/4	- 3/4	-11.5
A	HOLT,HERANEK & NEW	6- 12	8	- 1/8	-2.0
N	BUNKER-RAMO	6- 18	9 5/8	- 1/4	-2.5
A	CALCOMP	5- 13	8 1/2	- 5/8	-6.8
O	CAMBRIDGE MEMORIES	8- 15	13 5/8	- 7/8	-6.0
O	CENTRONICS DATA COMP	13- 32	27	-1 3/4	-6.0
O	CODEX CORP	9- 19	11	0	0.0
O	COGNITRONICS	1- 3	2	- 3/8	-15.7

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